

# COMPUTERWORLD

## IBM sings the PC blues

By Jaikumar Vijayan and Michael Fitzgerald

Big Blue is bleeding red all over its PC business. Despite plans to introduce an impressive slate of products this week, the IBM PC Co. is unlikely to bounce back into the black any time soon, observers said.

IBM's low-end woes are wide ranging, and the company is still struggling with a variety of reforms, including a wrenching corporate reorganization.

In the wake of the abrupt departure last week of senior executive James A. Cannavino, a well-known spokesman for IBM's PC business, concerns continued to mount.

IBM's major problems include the following:

- Continuing backlogs that plague its hard-IBM blues, page 113



HANK DE L'ESPINASSE

*"I'll surface again pretty quickly.... I'd like to be in something where the world changes more rapidly than not. It doesn't have to be in the industry."*

—IBM SENIOR VICE PRESIDENT JAMES A. CANNAVINO, WHO RESIGNED LAST WEEK

► SEE PAGE 113

## Novell bends

User pressure forces NetWare requester for NT, Windows 95

By Laura DiDio

Novell, Inc. last week said it will reverse months of internal politicking and quell a rising tide of user frustration by introducing a NetWare client requester for Microsoft Corp.'s Windows NT next quarter.

Similar support for Windows 95 is slated for that product when it ships later this year.

"Based on strong customer feedback, we have reevaluated and recommitted to providing cross-platform client connectivity," said Dawn Drake, Novell senior product manager for NetWare clients. "Novell will deliver support for both Windows NT and Windows 95 in a timely manner."

A NetWare client requester for Windows will

let users easily exchange files and access services between the two environments.

Without specifying exact dates, Drake added that Novell will deliver a client requester for Windows NT Server sometime this summer. The client requesters for the Windows NT and Windows 95 platforms will initially be available for a nominal fee — less than \$100 — and will eventually be bundled into the core network operating system.

Drake said Novell is currently "doing refreshes on the beta version" of the NetWare client requester for Windows NT at a limited number of customer sites. Preliminary beta software has been available on the Novell NetWare forum on CompuServe for several months,

Novell, page 113

## Network tools converge to monitor app behavior

By Steve Moore

Network monitoring and modeling tools are finally dovetailing in ways that will help users pinpoint poorly tuned applications — often the real culprits behind client/server network problems.

Make Systems, Inc. in Mountain View, Calif., this week will introduce nine add-ons to its NetMaker XA network modeling and planning product suite, according to a source close to the company.

These features include a set of application profiles to help users analyze how specific applications — such as Lotus Development Corp.'s Notes or an Oracle Corp. database — affect network performance.

In a related move, CoroNet Systems, Inc., a privately held start-up in Palo Alto, Calif., last week unveiled its CoroNet Management System, which enables users to monitor application performance

Network tools, page 16

## Firms draft cyber-safeguards

By Mitch Betts and Ellis Booker

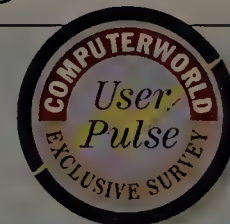
Fears that an employee's outburst in cyberspace will land the company in court are prompting many firms to set some rules.

Several major corporations — including Chase Manhattan Bank, Johnson Controls, Inc. and Monsanto Co. — last week confirmed they are crafting "appropriate usage policies" on how employees should behave on the infohighway.

Some have finished writing their cyberspace policies, while others are still drafting them. In all cases, corporate information systems, security and legal departments are heavily involved.

For example, Johnson Controls in Milwaukee Cyber-safeguards, page 12

IS professionals expressed moderate to great concern with the following on-line legal issues:



Privacy laws	62%
Libel	54%
Copyright/intellectual property laws	51%
First Amendment issues	36%
Pornography laws	28%

BASE: 100 RESPONDENTS; MULTIPLE RESPONSES ALLOWED

## Miss Manners' Guide to 'netiquette

You've read her witty etiquette column. You've followed her rules for proper behavior. Now, in an exclusive interview, syndicated columnist Judith Martin advises you on Internet etiquette. So sit up straight, take your elbows off your desk and turn to In Depth, page 85.



Miss Manners says: Don't be rude on-line

## IBM forges little big iron hybrid

By Craig Stedman  
LOS ANGELES

Call it a micromainframe. Seizing the downsizing bull by the horns, IBM will offer a System/390 processor embedded in a PS/2 server as a cut-rate platform for off-loading application development and some processing from traditional hosts.

The not-so-big iron was demonstrated at last week's Share, Inc. user group conference here, and IBM executives said it should be introduced in the next month or two at prices below \$100,000. Initially, the system will target software vendors and large mainframe shops that request special bids,

but a general rollout is expected before mid-year, they added.

The mainframe/PS/2 hybrid, called the PC Server 500 S/390, drew strong interest from several Share attendees. They said it could help reduce their software and maintenance costs by freeing them to move some applications off conventional mainframes.

IBM hopes the PS/2-based system will lower the cost of developing mainframe applications enough to persuade Unix software vendors to embrace MVS.

### Big savings

Northern Telecom, Inc., a maker of telecommunications equipment, was told that its monthly bill for IBM's VTAM networking software would drop from \$6,000 to approximately \$300 — 95% — if it installed the upcoming server hard-

Big iron, page 15



## Executive Briefing

**Novell will end the suspense** and engender a sigh of relief among frustrated users when it officially announces in two to three months that it will indeed deliver a client requester for Microsoft's Windows NT and Windows 95 environments. The NetWare requester will allow seamless connectivity between NetWare and Windows environments. *Page 1*

**Guarding against legal liabilities in cyberspace**, pioneering companies are writing usage policies on what their workers can and cannot do on the Internet and other on-line services. Whether they have just finished writing their cyberpolicies or are still drafting them, corporate IS and security and legal departments are heavily involved. *Page 1*

**Seizing the mainframe downsizing bull** by the horns, IBM plans to market a System/390/PS/2 hybrid as a cut-rate platform for off-loading application development and some processing from host systems. *Page 1*

**No one is writing the obituaries yet**, but the IBM PC Co. is almost dead in the water. As losses mount and market share drops, the beleaguered company is fighting back with new notebooks, servers and desktop PCs — but is the effort too little, too late? *Page 1*. James A. Cannavino leaves IBM after 32 years. *Page 113*

**Companies are fighting back against postal rate increases** with software that cleans up addresses, adds bar codes and presorts mail. *Page 61*

**On site this week:** John Deere's Waterloo Works was running out of bandwidth on its point-to-point Ethernet wide-area network switches. It installed Digital's GigaSwitch/FDDI device to solve bandwidth constraints, improve network scalability and cut costs. *Page 53*. The IS director at New Orleans' The Audubon Institute has to do more with less, and succeeds. *Page 40*. Europcar International now has one of the largest Unix-based systems worldwide. *Page 63*. Toronto-based Scotiabank dives into object technology by standardizing on Versant's object database. *Page 69*

## The 5th Wave by Rich Tennant



"You know, I liked you a whole lot more on the Internet."

# Tunnel Vision

IS holds the key to making **ergonomics problems** such as carpal tunnel syndrome better or worse for computer users. But the fact that they ignore the issue is often painfully obvious. *See Management, page 77.*

## NEWS

■ **PC industry consolidation** takes a new shape in the wake of the AST/Samsung convergence. *Page 4*

■ **Middleware products** promise to help corporations build **mobile applications**, but users seem uncertain of what they really are. *Page 6*

■ **Covia** takes aim at IBM with beefed up middleware software. *Page 6*

■ **Cisco** says it will deliver capabilities needed to enable the use of **multimedia applications** over existing network infrastructures. *Page 10*

■ **Observers** say Digital's LinkWorks has the technical prowess to be a Notes-killer, but the company is walking away from the fight. *Page 14*

■ **Hewlett-Packard** provides a glimpse of its 64-bit processor plans but stays mum on its collaborative development with Intel. *Page 16*

■ **Microsoft** will have **hierarchical storage management** capabilities in the next release of NT. *Page 20*

■ **Baan** is gaining ground in the U.S. client/server manufacturing software market. *Page 24*

venerable MicroVAX. *Page 45*

## ENTERPRISE NETWORKING

■ One of the first attempts at **interactivity** over a cable system is met with both praise and derision. *Page 53*

## LARGE SYSTEMS

■ **Cray Research** targets industrial users with its next generation of supercomputers. *Page 61*

## APPLICATION DEVELOPMENT

■ Add-ons push users past **Visual Basic** limits. *Page 69*

■ **Test-drive: Visual FoxPro** should smooth the transition path for FoxPro users moving to graphical user interfaces. *Page 71*

## IN DEPTH

■ **Miss Manners** gives pointers on proper Internet behavior. *Page 85*

## CAREERS

■ **Internet security** could be the next hot new career. *Page 90*

## MARKETPLACE

■ Pickings are still slim in E-mail privacy products. *Page 101*

## COMMENTARY

■ **Bill Laberis** warns that the hacker-as-hero stereotype has gone too far. *Page 34*

■ **Charles Babcock** urges IS to be on alert for hacker attacks not only from the Internet but from the phone lines, too. *Page 8*

■ **John Diebold** says the global public infrastructure needs rethinking. *Page 35*

■ **Esther Dyson** finds that the action in software isn't in the products but in new business and pricing models. *Page 35*

**Calendar**.....*Page 82*

**Company Index** .....*Page 110*

**Editorial/Letters to the editor** .....*Page 34*

**March 3 Stock Ticker**.....*Page 111*

**How to contact Computerworld** ... *Page 114*



## DESKTOP COMPUTING

■ **Electronic software distribution** remains an immature market, but products are still providing benefits. *Page 39*

## WORKGROUP COMPUTING

■ **Pricing** questions haunt Digital as it pitches a low-end workstation and a replacement for the

## How do you measure up?

How does your IS department compare with the Computerworld Premier 100? Fill out the Premier 100 survey, and we'll send you a free report showing how your operation compares with Premier 100 averages. Consolidated information from the surveys we collect may be published in a future Premier 100 issue. Send a request on company letterhead to Paul Gillin, Editor, Computerworld, 375 Cochituate Road, Framingham, Mass. 01701 or E-mail to survey@cw.com.



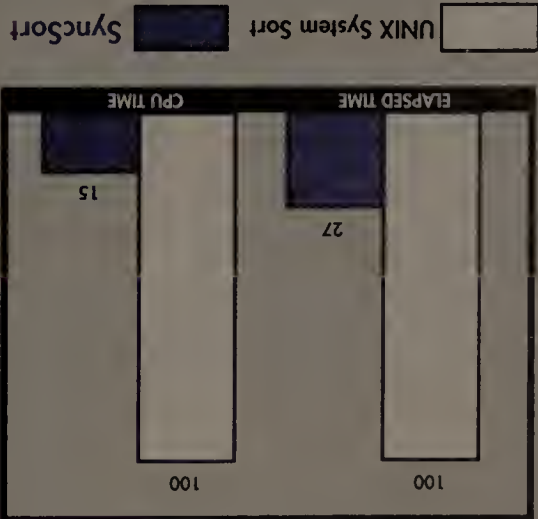


Applications Work – call us.  
Making Your Commercial UNIX  
FREE copy of our booklet –  
To order SyncSort or for a  
UNIX applications work.

need to make your commercial  
performance and functionality you  
SyncSort provides the per-  
text – slowly!  
All it can do is sort ASCII  
its System Sort isn't one of them.  
UNIX has its advantages, but

RECORD FORMATS		
UNIX System Sort	YES	YES
Fixed length binary	NO	YES
Variable length binary	NO	YES
ASCII Text	YES	YES
RECORD PROCESSING		
Selection	NO	YES
Reformatting	NO	YES
Summation	NO	YES
Grouping	NO	YES
COLLATING SEQUENCES		
Standard ASCII	YES	YES
EBCDIC	NO	YES
User Defined	NO	YES
Multi-byte	NO	YES

## FUNCTIONS



## PERFORMANCE

UNIX

The UNIX System Sort



# Market pressure pushes firms to the limit

## AST Research joins with Samsung Electronics to gain stability

By Michael Fitzgerald

Last week's \$450 million investment by Samsung Electronics Ltd. in cash-starved AST Research, Inc. was seen by some observers as a preview of what could happen in the wake of price cuts expected from major PC makers this week. It means consolidation. Or does it?

AST's cash woes, brought on by an inability to execute on new products and intense market pressure, probably forced the company to seek a suitor, analysts said. Korean conglomerate Samsung gains a 40.25% chunk of the Irvine, Calif., computer maker, which is still the world's sixth-largest PC company.

Despite its friendly investor, AST and its brethren will continue to face significant market pressure. Last Friday, fast-climbing Hewlett-Packard Co. cut prices on new desktops by up to 11%—its third reduction in four months. Simultaneously, Zenith Data Systems rolled back prices by up to 29% across its entire 486 product line. Compaq Computer Corp. and IBM PC Co. are expected to follow suit this week.

### Vendors fight to hold on

Still, despite the continuous price actions of the past two years, no one has actually seen "vendors go down the tubes totally," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass. He said "even companies like Everex and Northgate that ultimately hit bottom had some kind of bounceback

and still play in the market."

So far this year, two other PC suppliers who came close to the abyss managed to escape disaster. Zeos International, Inc. in St. Paul, Minn., was purchased by Micronics Computers, Inc. in Fremont, Calif., and CompuAdd Corp. in Austin, Texas, was bought out by Taiwanese interests.

However, price wars have affected even the seemingly solid bets. Zwetchkenbaum said in terms of market share, the Top 10 players just held their ground last year after experiencing solid growth in 1993. And four of them—the PC Co., Apple Computer, Inc., Dell Computer Corp. and AST—even lost share.

### Price plunge continues

HP last week continued its assault on PC prices by rolling back pricing by up to 16% on its OmniBook notebooks, up to 11% on the Vectra desktop PCs and up to 13% on its NetServer lines.

### Eliminating user problems

What this seems to mean for users is that even if their vendor of choice runs into trouble, they are unlikely to get stuck with unsupported hardware. In addition, they probably can avoid the costly and time-consuming system testing involved in finding a replacement vendor.

That is because industry officials predict that the pace of relationships, and possibly mergers, will continue. Compaq's recently announced design and manufacturing relationship with Taiwan's Inventec Group is cited by many as an example of how even the most profitable players need outside help.

The AST/Samsung relationship "is more convergence" than a sign of consolidation, said AST's chairman Safi Qureshey last week. Fresh off a plane from Korea, where he met with Samsung executives, Qureshey

stressed that AST's link with Samsung would help it move into new markets. He is particularly interested in the still-undefined but rapidly growing consumer market, with its potential for set-top boxes and computerized devices that are expected to replace telephones and possibly even televisions.

"We can't just stand alone," Qureshey said. "We're not just selling to the Fortune 500. Today, it's the Fortune 5 million, and ultimately, it's the World 5 billion. In trying to reach those customers, the computer itself is changing."

Qureshey said the race to capture the cost-conscious but huge consumer market will see more and more companies engaging in outside alliances. The trend is another sign that corporate users are becoming less important in pushing technology forward. In the past year, vendors have pointed to the consumer market as driving demand for technologies such as multimedia and Intel Corp.'s Pentium, while corporations hold back and test technologies carefully before deploying them.

This situation benefits the corporate user, Qureshey said. "They're not the early adopters... so they will get lower pricing and better knowledge of the products."

Senior writer Jaikumar Vijayan contributed to this story.



**AST Chairman Safi Qureshey says the company's link with Samsung will help it move into more lucrative markets**

ALR abandons commodities. See page 32.

## Document management

# Oracle delays release of groupware products

By Kim S. Nash

Oracle Corp.'s groupware strategy is changing by the minute.

The Redwood Shores, Calif., company is expected this week to revise delivery dates and packaging for its forthcoming groupware product set, sources familiar with the company's strategy said last week.

Formerly known as Oracle Documents, the product line was renamed Groupware/2000 late last week, playing off the Workgroup/2000 moniker of Oracle's PC-level databases and tools.

Groupware/2000, which Oracle plans to unveil this week at the GroupWare '95 show in Boston (see story page 14), is a suite of workflow, document management and multimedia electronic-mail products, among others. It is the successor to the Oracle Office 2.0 office automation product set.

### Delays expected

But Oracle has delayed by several months the beta testing of the document management part of Groupware/2000—dubbed Oracle Library—until late this month or early April, according to users

briefed by Oracle.

That is disappointing to customers anxious to start using the Oracle-built groupware that the company began talking about 18 months ago [CW, Sept. 6, 1993].

### Oracle and Lotus are working on the following ways to integrate their products:

- A bridge to connect Notes to the Oracle7 database.
- Links between Notes and Oracle's Cooperative Development Environment (CDE) tools so programmers can build applications with CDE that can use Notes data.
- Modifications to the Lotus Script scripting language to understand PL/SQL, Oracle's brand of SQL.

Camp Dresser & McKee, Inc., an environmental consulting firm in Cambridge, Mass., had hoped by now to be in the thick of a project to put complex engineering drawings on-line and encourage tighter teamwork at the company, said Peter Palmisano, chief information officer.

"We were originally supposed to get a beta version of [Library] last fall," Palmisano said. "We've had to slow down our document management plans."

Meanwhile, five months after Oracle

and Cambridge, Mass.-based Lotus Development Corp. announced separate plans to build bridges among Notes and a variety of Oracle products, users have seen neither hide nor hair of such links. Integration had been expected by now [CW, Oct. 3, 1994].

### Joining forces

Mutual mudslingers beforehand, Lotus and Oracle surprised the industry last September with a vow to jointly build two-way links between Notes and the Oracle7 database and other Oracle products. While engineers at both companies have mapped out design specifications for three types of integration, the products are "not in shape now to be tested by customers," said a source close to Oracle (see chart).

The products are scheduled to enter beta testing this summer, according to the source. General availability is slated to coincide with the shipment of Notes 4.0 in September, the source added.

Tim Davenport, vice president of de-

veloper tools at Lotus, confirmed that the companies are several months away from full-fledged products. He added that the promised Notes-to-Oracle bridges are still on track for delivery "some time in 1995."

E-mail is also on the table; the firms may link directories for Oracle Mail and Lotus' CC: Mail, Davenport confirmed.

Oracle loyalists are the most likely candidates to buy Oracle-built groupware products, said Thomas Koulopoulos, co-chairman of the Workflow Management Coalition. The group, which includes 80 vendors, users and analysts, is working to define

interoperability standards among workflow products.

Yet "outside of that base, very few people are looking at Oracle as a groupware provider," Koulopoulos said. "They just want to be able to attach a relational database in a useful way to Notes."

**A deal between Lotus** and Verimation gives Notes users another front end. See page 46.

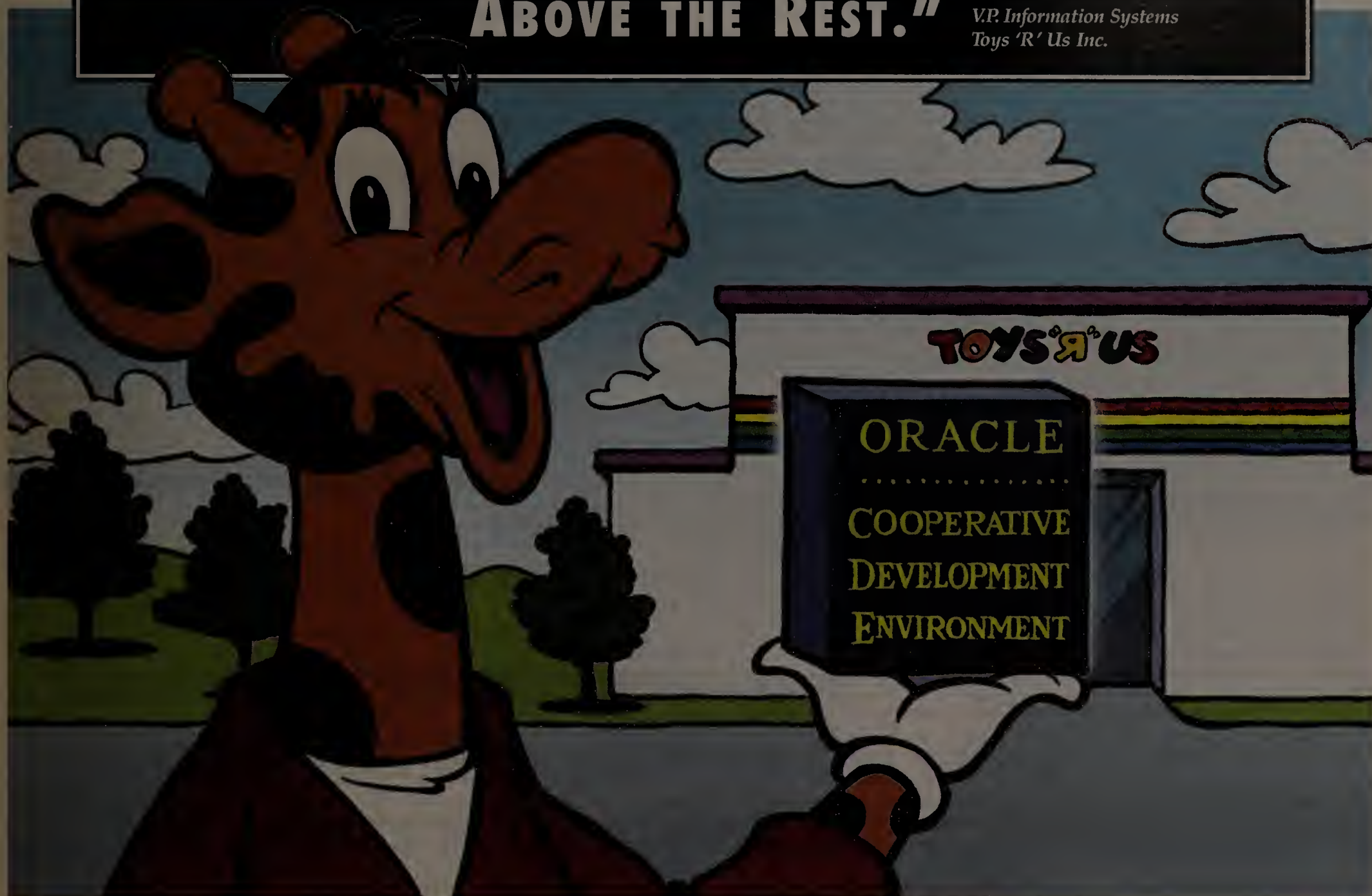
**Notes-to-Oracle bridges are scheduled to enter beta testing this summer, according to a source close to Oracle. General availability is slated to coincide with the shipment of Notes 4.0 in September.**



# "ORACLE CDE STOOD HEAD AND SHOULDERS

## ABOVE THE REST."

Eileen Gabriel  
V.P. Information Systems  
Toys 'R' Us Inc.



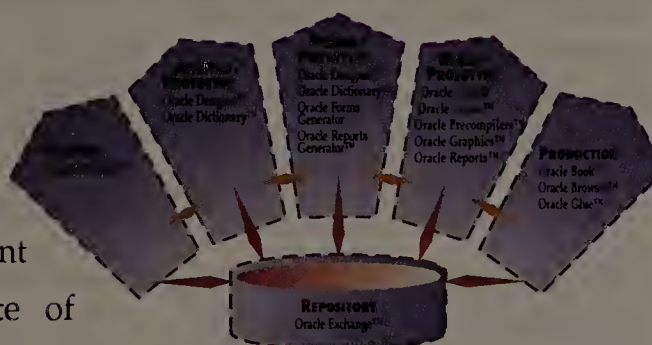
### WHY THIS LEADING RETAILER CHOSE ORACLE CDE FOR WORLDWIDE APPLICATIONS DEVELOPMENT.

After real world testing of all the major competitors, Toys 'R' Us chose Oracle Cooperative Development

Environment (CDE) suite of tools, Oracle Consulting and Oracle Support to help build in-store and back office systems for the world-wide chain. "Oracle's flexibility will dramatically shrink our



Oracle sells more tools than any independent software company.\*



CDE's open, integrated solution for enterprise-wide client/server applications development covers the entire development cycle. It includes CASE, 4GL, 3GL and enduser tools in a repository-driven modular approach to reducing development time.

implementation time and costs for new customer service, distribution, and corporate office mission critical-applications," comments Ms. Gabriel. For the CDE Technology and Executive Brochures that provide a complete overview of CDE products, call 1-800-633-1071, Ext. 8167.

# ORACLE



# Mobile confusion mounts

Defining middleware remains a problem; wireless apps burden user resources

By Michael Fitzgerald

■ Corporations looking to serve up effective mobile applications are finding themselves anxiously sifting through a menu of middleware products that might as well be in hieroglyphics.

The products actually perform a variety of functions that make them more than middleware, so users seem uncertain of what the products really are. Middleware, which has a variety of definitions, is a technology that typically sits between an application and an operating system and allows for the transfer of information between incompatible operating systems.

"The biggest issues [in mobile computing] aren't technical. They're defining what it all means for customers and where's the business value," said Allan Lees, manager of strategic planning at Sybase, Inc.

For instance, wireless applications, considered an essential piece of mobile computing, "right now put an enormous burden on the user," Lees said. "We made the assumption that if you're a company using mobile computing, your application developers don't want to care about what they're writing to, and your users don't want to care about what transport you're using."

## Missing technology

To the customer, not having to care about development and transport protocols translates into buying one piece of software that will accommodate

both current and future applications without writing new code. It also means the ability to use any network — wired or wireless — seamlessly and transparently.

Neither situation exists today.

"We want something to let us use disparate networks — circuit-switched cellular, CDPD or whatever," said Dayakar Veerlapati, a research analyst at Union Pacific Technologies in St. Louis. "Our folks should be able to access any transport mechanism." The lack of

While analysts consider KeyWare a breakthrough product, obstacles to wireless remain. For example, middleware, no matter how effective, does nothing to reduce the price of the services — a main reason users cite for resisting the move to wireless.

"When you have a sales force of 50-plus people, and the minimum fee is \$80 a month per unit, you're spending a lot of money," said Joe Manning, MIS director at Wilson Sporting Goods in Chicago, which is scaling back its pioneering wireless sales force automation project (see story below).

Cost aside, many users say they would like the ability to combine the various wireless networks to improve coverage. Those networks include Ardis Co.'s Advanced Radio Data Information Services network, RAM Mobile Data USA L.P.'s Mobitex network and the multivendor Cellular Digital Packet Data (CDPD) protocol.

Middleman		
Products that link various wired and wireless services are coming at the market from every conceivable angle. The following are a few examples:		
Vendor/Product	Operating system	Protocol
Racotek KeyWare	OS/400, OS/2, Unix, Windows, DOS	TCP/IP, IPX, SNA, LU6.2, NetBIOS
Oracle Oracle-in-Motion	Unix (services), Windows (clients)	TCP/IP
Xcellenet RemoteWare 2.0	Unix derivatives, Windows, DOS, OS/2, Mac OS, VAX/VMS	TCP/IP, NetBIOS, SPX

Source: Aberdeen Group, Boston

that ability has muted Union Pacific's interest in wireless.

Recent moves in the market may serve as a sort of Rosetta stone for mobile users. On Feb. 17, for instance, Sybase purchased Complex Architectures, Inc. in Wakefield, Mass., lending credibility to a start-up whose Enterprise Messaging Services product lets messaging services run over multiple protocols. That same week saw Racotek, Inc. introduce KeyWare, an environment that bridges incompatible wireless and wireline networks and provides a universal application programming interface.

## Product pileup

Still, the array of products on the market tends to add to the confusion rather than reduce it:

- A product such as Xcellenet, Inc.'s RemoteWare 2.0 is considered primarily a network management tool, not middleware, but it could be used to piece together a seamless wireless network.

- Racotek officials say KeyWare is not middleware at all but rather an application environment.

- Oracle Corp.'s Oracle-in-Motion provides a way to integrate Oracle database back ends with clients over both wired and wireless networks. It thereby performs some of the functions of middleware, though it is intended to make data queries easier for mobile users to perform.

And these are just a few products that could be used as middleware.

"It's a pretty confusing market. Breaking every product down into ... what it does and doesn't do is difficult," said Virginia Brooks, an analyst at Aberdeen Group in Boston.

Still, some users say the appearance of a product such as KeyWare may make it easier for users to build their own networks.

"Right now, you've got to make one of three decisions: Architect the whole [wireless network] yourself, farm it out to some consultancy with expertise in wireless data or throw yourself at the mercy of the vendors and say, 'Here's a blank check. Make it happen,'" said Lee Nolan, a senior telecommunications engineer at The Travelers Insurance Co. in Hartford, Conn.

## A wireless disconnect

Wireless is being hung out to dry by at least one pioneering user. Wilson Sporting Goods' golf course division, which adopted the technology in July 1993, last month severed its final wireless ties.

The Chicago company was a pioneer in using Ardis Co.'s Advanced Radio Data Information Services Network (ARDIS) for its sales force. It leased ARDIS radio modems for its 50 salespeople, who were already using notebooks.

Wilson decided in the fourth quarter of 1994 that it wanted to start moving away from wireless because of such issues as cost, usage and limited coverage, said Joe Manning, Wilson's MIS manager.

"We're not completely against [wireless], but we're concerned about our territory coverage," Manning said. He added that the sales force had been reluctant to use wireless, in part because of the ungainly external modem. Also at issue was that costs were higher than Wilson would have liked — a minimum of \$80 a month per user, not including potential roaming charges.

While Wilson could potentially address coverage with a product such as Racotek's KeyWare, Manning said the difficulty of gauging wireless's return on investment would probably mean the company will wait a while before it returns to the technology.

—Michael Fitzgerald

## Middleware

# Covia offering aimed at IBM

By Rosemary Cafasso

Covia Technologies plans to open fire on IBM in the message-oriented middleware market this week with an upgraded version of Communications Integrator.

The Rosemont, Ill.-based company, a division of Galileo International, is scheduled today to introduce Communications Integrator Release 3.1, which will contain more than a dozen additional components ranging from improved systems management functions and developer tool kits to a link to Notes. Many of the new functions are slated to ship in the second quarter.

With about 40 customers, Communications Integrator most directly competes with IBM's MQ Series. While analysts note that there are dozens of middleware players, IBM and Covia are the only companies currently targeting large-scale information systems shops that need comprehensive middleware offerings.

## A sample of Release 3.1's upgrades

**Tool kits**, including a "Communications Integrator For Dummies," which provides sample code and guidelines and an Applications Developer's Toolkit, which includes routines for setup and calls.

**Security upgrades**, including links to IBM's Resource Access Control Facility to filter messages routed via Communications Integrator.

**Management tools**, including CI View, which allows users to view the contents or state of information about the network, and CI Configurator, which assists in setting up files to configure a middleware network.

**Database Access Additions**, which will provide support for several relational database management systems, starting with Sybase, Inc.'s system.

"This is a shot right over the IBM bow," said Sally Cusack, an analyst at Standish Group International, Inc. in Dennis, Mass., of Covia's 3.1 rollout.


Message-oriented middleware is one approach to the critical task facing nearly every IS site — gluing together a mixed bag of applications on multiple platforms. With message-oriented middleware, applications can communicate by sending messages to one another for such tasks as requesting data. The middleware handles the communications, different protocols and translations.

Covia's Release 3.1 "is of interest to the big guys, those large companies with multiple platforms to be integrated," said Paul Mason, an analyst at International Data Corp. in Framingham, Mass.

Healthcare Data Exchange, a subsidiary of Shared Medical Systems Corp. in Malvern, Pa., said it is looking forward to several features in Release 3.1 but is particularly anxious to get hold of a remote management component, said Gary Talda, a senior programmer/analyst.

Currently, Healthcare Data Exchange has to manually update 30 remote sites when changes are required, which is "very time-consuming and extremely labor-intensive," Talda said. With 3.1, Talda said he would be able to set up changes and execute them from a central site.





# What would you do if you could make real-time changes and watch their effects at the same time?

## Micro Focus Revolve®

Significantly reduce system maintenance and enhancement costs with

Revolve's ability to perform system-wide impact analysis and documentation.

Micro Focus Revolve is a powerful development and analysis tool that allows you to graphically view any application and the impact of any changes to it.

Unlike less scaleable products, Revolve quickly and clearly documents the relationships between source code, data, screens, JCL and other aspects of very large systems to help you accurately estimate the cost and timing of projects. The impact analysis tool then identifies all of the locations and effects of proposed changes, such as updating the date calculation to go beyond the year 1999.

Revolve seamlessly integrates with Micro Focus COBOL or can be used as a stand alone development, testing and analysis environment. In either case it lets you manage your system and see exactly how far your changes will reach.

**See for yourself. Contact**  
**Micro Focus at 800 MF COBOL**  
**Ext. 1203 and ask for**  
**your copy of the**  
**Micro Focus CD.**  
**On it, you'll find**  
**descriptions and inter-**  
**active demonstrations of Micro**  
**Focus Development Tools.**



*"A better way of programming"*

**MICRO FOCUS®**



# A hacker's lines of attack

**T**he FBI and computer security experts recently tracked down and arrested Kevin D. Mitnick for vandalism and theft on the Internet. But IS managers can draw little comfort from this episode.

Yes, the Internet is more prone to security problems than your corporate network, and yes, on-line services such as the The Well in Sausalito, Calif., offer more points of entry than your mainframe database. But consider this: Friendly callers — employees working from home, suppliers, outside consultants — are given access to your computer system from dozens of telephone lines into your company. As an IS manager, you expect the telephone system to be secure. Guess again.

Mitnick is commonly described as a criminal hacker but he might be more accurately characterized as a felonious "phone phreak." His previous arrest and conviction stemmed from his breaking into Digital's internal DECnet. Digital's network security at the time ranked among the best. But for 18 months, its network police watched and tracked Mitnick's intrusions but could not identify him or stop his break-ins.

At one point, Mitnick downloaded the source code to the VAX operating system, Digital's crown jewel on which it placed a value of \$1 million. Mitnick's associate blew his cover, and Digital had him arrested and convicted. But it could not have done so on the strength of its policing. One of Mitnick's tactics was to read the E-mail of his trackers and avoid their traps.

To appreciate the hazard posed by skilled hackers, consider the central office switches of the local telephone company as merely specialized computers, with their own software commands and limited safeguards. These computers can be broken into by outsiders who know how to methodically search them for the lines that are connected to your computers. Mitnick is believed to have rummaged through the phone lines at the Nashua, N.H., central telephone office, the site of Digital's software development facility, until he found a line open to Digital's computers.

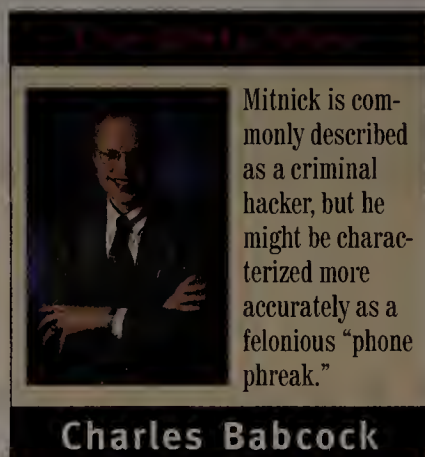
Digital's programmers frequently dialed into the office systems while working from home, and someone no longer working on a line had not logged off, leaving open a line into an access port. The interesting part is that this alone would not have gotten Mitnick as far as he wanted to go. But having seized an open line, he then called a Digital computer operator, posing as a Digital programmer, and asked to be logged in with system manager privileges. The operator obliged.

"Once logged in with manager's privileges, Mitnick disabled the system audit function, created an account for himself that would then be invisible and turned the audit back on. The whole attack took less than five minutes," notes Ray Kaplan, consultant for CyberSafe Corp., a commercial security firm in Redmond, Wash.

How could Digital's security experts have foreseen this exposure? Morrie Gasser, author of *Building A Secure Computer System*, says, "The problem is people, not computers." Or as Kaplan notes, a skilled hacker, given an access line, can penetrate nearly any system. "Most have more holes than Swiss cheese," he says.

When caught this time, Mitnick was at his ham-handed worst. He left taunting voice mail for computer security expert Tsutomu Shimomura at the San Diego Supercomputing Center.

What if an equally skilled hacker broke into your company's computers but lacked Mitnick's craving for attention? Mitnick never did anything for profit with the VMS source code or the alleged 20,000 credit-card numbers he is accused of taking from Netcom Communication in San Jose, Calif. Other intruders might be less disinterested in material gain. What is your database worth? How good is its protection?



Mitnick is commonly described as a criminal hacker, but he might be characterized more accurately as a felonious "phone phreak."

Charles Babcock

Babcock is *Computerworld's* technical editor. His MC1 Mail address is 575-2737.

## News Shorts

### Shell outsources PC support, service

London-based Shell Group last week confirmed it has given a "framework" contract to a vendor consortium to manage all aspects of installation, maintenance, training, help desk and technical support for its 80,000 PCs worldwide. **Bell Atlantic Corp.** in Philadelphia is the designated preferred support provider for Shell Group operating companies in North America. A spokeswoman for **Shell Oil Corp.** in Houston said the U.S. branch of the company will not be affected by the contract; Shell Oil has already outsourced most of its PC support activities to multiple vendors.

### Unix desktop at UniForum '95

Attendees at **UniForum '95** in Dallas next week will get their first glimpse of Common Desktop Environment (CDE), a graphical desktop interface for Unix machines. Developed jointly by **Digital Equipment Corp.**, **Hewlett-Packard Co.**, **IBM**, **Novell, Inc.**, **SunSoft, Inc.** and **TriTeal Corp.**, CDE will feature a PC-like calendar, electronic mail and desktop applets combined in a graphical user interface for major Unix vendors to use.

### Eager exits Community Mutual

After about a year on the job, Bill Eager has left the post of chief information officer at **Community Mutual Insurance Co.** A spokesman for the Cincinnati-based firm last week declined to give a reason for Eager's departure. Earlier this year, Eager was credited by a Community Mutual vice president as significantly improving information systems operations at the company. Eager joined Community in January 1994 as its third CIO in four years. Community has named corporate IS director Steve Bowman as acting CIO.

### Rietveld leaves WordPerfect

In a surprise move, **Novell, Inc.** said last week **Adrian Rietveld**, executive vice president and general manager of WordPerfect, the Novell Applications Group, since 1992, was leaving the company "to pursue personal interests." No replacement was named. In a prepared statement, Novell said Rietveld's direct reports will report to company President and CEO Robert Frankenberg. Rietveld assumed the top spots at WordPerfect just months before the company was acquired by Novell.

### IBM ships DOS 7.0

IBM last week shipped PC-DOS 7.0, which includes **Stacker 4.0** disk compression software from **Stac Electronics**, extensive on-line help and improved mobile computing features, including file synchronization. It will also feature **Central Point Software's** RAMBoost memory optimizer and backup utilities.

### OS/2 Warp Connect to expand

IBM said it will expand beta testing on OS/2 Warp Connect, which bundles Warp with a range of networking and connectivity software, next week. Included in the package is support for TCP/IP, remote connections, peer-to-peer networking and client access to Novell, Inc. NetWare, IBM LAN Server and Notes networks. General availability is expected in late April or early May.

### AlliedSignal teams with HP

**AlliedSignal Aerospace Co.** in Torrance, Calif., signed a three-year contract with **Hewlett-Packard Co.** that makes HP the sole supplier of Unix workstations for its engineering units. The contract, valued at \$30 million, will have the greatest impact at 10 major sites, according to Paul Hoedeman, CIO at AlliedSignal Aerospace, the \$4.6 billion arm of \$12.8 billion AlliedSignal, Inc. Hoedeman said the company is standardizing on one hardware vendor to ease support and service tasks.

### CA puts new tool set into Unicenter

**Computer Associates International, Inc.** last week said it will integrate **BMC Software, Inc.'s** Patrol application and database management tool set into its CA-Unicenter cache. The CA/BMC accord raised uncertainty about the future of two recently acquired CA products: CA-Unicenter/DB Alert and CA-Unicenter/Systems Alert, both of which overlap with the functionality of BMC's Patrol tools. CA will offer its customers both sets of event-detection software, an executive said.

### DEC launches DECadmire

**Digital Equipment Corp.** said last week it will launch today DECadmire for Visual Basic, the first version of the client/server application development package to provide a Windows user interface. It includes a team development framework linked to Microsoft Corp.'s Visual Basic and generates all the code logic for client and server.

### Benchmarks for SNA over TCP/IP

**The Tolly Group**, an independent testing lab in Manasquan, N.J., plans this week to release the result of benchmarks it ran for routing SNA data over TCP/IP using equipment from a range of router vendors. Among companies supporting the RFC 1434 precursor to the proposed Data Link Switching standard, **Bay Networks, Inc.** got the highest composite score followed by **Proteon, Inc.** and **IBM**, Tolly said. Also tested were several proprietary SNA-over-TCP/IP implementations; **Cisco Systems, Inc.** just barely scored higher than **Hughes Network Systems** in that arena.

**SHORT TAKES** Florida lawyer Anthony R. Martin announced the formation of a Palm Beach, Fla.-based political action committee called the **Committee to Fight Microsoft**. It will lobby for antitrust legislation curbing Microsoft's market power. ... **Harri's Computer Systems** in Fort Lauderdale, Fla., said its \$29.6 million offer to acquire **Concurrent Computer Corp.** in Oceanport, N.J., was rejected by Concurrent's board. ... **SunSoft, Inc.** in Mountain View, Calif., last week extended its Solaris 2.4 Unix operating system to multiuser Intel Corp.-based servers.



51 Issues for ~~\$48~~ \$39.95

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$39.95\* per year - a savings of \$8.00 off the basic subscription price. Plus, I'll also receive the '94-'95 COMPUTERWORLD Salary Survey FREE just for trying COMPUTERWORLD. P/Code 98

First Name	MI	Last Name		
Title		Company		
Address		City	State	Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48 per year  
\* U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

  - 10. Manufacturer (other than computer)
  - 20. Finance/Insurance/Real Estate
  - 30. Medical/Law/Education
  - 40. Wholesale/Retail/Trade
  - 50. Business Service (except DP)
  - 60. Government - State/Federal/Local
  - 65. Communications Systems/Public Utilities/Transportation
  - 70. Mining/Construction/Petroleum/Refining/Agric.
  - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
  - 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
  - 90. Computer/Peripheral Dealer/Dist./Retailer
  - 95. Other (Please Specify)
2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT

  - 19. Chief Information Officer/Vice President/ Asst. VP
  - IS/MIS/DP Management
  - 21. Dir./Mgr. MIS Services, Information Center
  - 22. Dir./Mgr.: Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin Svs.
  - 23. Dir./Mgr. Sys. Development, Sys. Architecture
  - 31. Programming Management, Software Developers
  - 41. Engineering, Scientific, R&D, Tech. Mgt.
  - 60. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

  - 11. President, Owner/Partner, General Mgr.
  - 12. Vice President, Asst. VP
  - 13. Treasurer, Controller, Financial Officer
- DEPARTMENTAL MANAGEMENT

  - 51. Sales & Mktg. Management
  - 70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

  - 80. Information Centers/Libraries, Educators, Journalists, Students
  - 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems

(a) Solaris	(e) Mac OS
(b) Netware	(f) Windows NT
(c) OS/2	(g) Windows
(d) Unix	(h) NeXTstep

App. Development Products ☐ Yes ☐ No

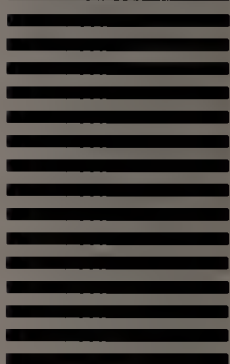
Networking Products ☐ Yes ☐ No

COMPUTERWORLD





NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P O BOX 2044  
MARION OHIO 43306-2144





# BUY A COMPAQ NOTEBOOK AND GET A DESKTOP FREE.



*Compaq SmartStation*

*Compaq LTE Elite 4/75CX*

**\$700  
VALUE**

Just how do you get two PCs for the price of one? Buy a Compaq LTE Elite 4/50CX or 4/75CX by April 30th, and we'll give you a Compaq SmartStation to go with it—free.

And what's so smart about a Compaq SmartStation? It's loaded with unique features like "VCR-style" motorized docking, plug-and-play capabilities and integrated Ethernet support. And, when combined with our top of the line LTE Elite, it's like getting a network-ready, expandable desktop. What's even more remarkable is that it's free—still another reason why you will find this combination

to be the perfect solution for your needs in the office.

There's nothing lost when you're on the road, either. Because the LTE Elite is our most powerful notebook. And with its built-in AC adapter, you won't find yourself lugging around any extra baggage.

Simply put, buying an LTE Elite right now and getting a free SmartStation is a great deal. And this terrific offer is only available from Compaq. So, if you want to find out where you can buy one great computer for the road and get another for the office free, you should call us now.

**COMPAQ**

C A L L 1 - 8 0 0 - 3 9 2 - 8 8 8 3

\$700 value based on estimated street price. Reseller prices may vary. Offer valid from 2/1/95 through 4/30/95 or while supplies last. Offer valid in U.S. only. Keyboard, mouse and monitor not included. Compaq, registered U.S. Patent and Trademark Office. LTE Elite and SmartStation are trademarks of Compaq Computer Corporation. © 1995 Compaq Computer Corporation. All rights reserved.



# Cisco attacks crowding on multimedia nets

By Stephen P. Klett Jr.  
SAN FRANCISCO

One question haunting multimedia aficionados these days is whether the network infrastructure at a typical business can handle the bandwidth demands of multimedia applications.

According to Cisco Systems, Inc., that is not a problem. At a multimedia conference here last week, the San Jose, Calif.-based internetworking company unveiled a framework said to enable users to begin using multimedia applications today, without expensive and disruptive upgrades to their networks.

"The perception that the only way to get the necessary bandwidth is to bring in ATM is wrong. Users don't need to overhaul their nets or change their switching infrastructure," said John Chambers, Cisco's president and chief executive officer.

These bold claims — from a company

not known as a multimedia leader — raised eyebrows among users and analysts. However, Cisco said by year's end it will deliver additions to its Internet-working Operating System (IOS) software that will put its infrastructure where its mouth is.

In combination with current IOS capabilities, these additions were designed to enable real-time delivery of collaborative applications combining text, voice, images and video across LANs and WANs.

By midyear, Cisco will add a weighted fair-queuing algorithm to its IOS software to reduce latency and minimize jitter. The algorithm should improve the quality of service in desktop video applications, observers said.

## Following protocol

Cisco is also working with the Internet Engineering Task Force and multimedia developers to deliver the Resource Reservation Protocol, a standard internetwork protocol that will let applications reserve the bandwidth for different classes of service. Scheduled for delivery in the second half of this year, this protocol will support multiple network protocols such as TCP/IP, Novell, Inc.'s IPX and Apple Computer, Inc.'s AppleTalk.

Finally, Cisco now supports IP Multicast multiprotocol packet delivery on its switch and router platforms. With IP Multicast, a user sends a packet addressed to multiple recipients and the network replicates the packet only when needed.

This transmission method will provide better bandwidth efficiency compared with traditional techniques such as broadcast, which forwards packets to everyone on the network to ensure they reach their intended recipient.

"What Cisco's done with multicasting is give us a much more rational way to deploy multimedia applications in a production environment," said David Meyer, senior network engineer at the University of Oregon in Eugene.

The university is using an IP Multicast-enabled Cisco router to run videoconferencing applications and shared whiteboard applications among individual engineers. "You can do a lot more with multimedia than the average person believes today without completely re-engineering your network," Meyer said.

Analysts agreed that the IOS capabilities would enable at least low-end multimedia business applications such as presentations over existing LAN and WAN infrastructures.

"This is wonderful news for my clients because it means they don't have to rip out existing equipment and applications to use multimedia today," said Al Lill, an analyst at Gartner Group, Inc. in San Jose, Calif.



## Only Minolta can melt information problems with I.C.E.

I.C.E. — Integrated Computer-output Extension. Only Minolta's MI<sup>3</sup>MS<sup>3</sup> 3000 Integrated Image/Information System offers this breakthrough productivity tool.

With MI<sup>3</sup>MS 3000 I.C.E. you can automatically index and store electronic documents originating on mainframes and other systems. Make invoices, purchase orders, etc., part of your imaging database with no need to scan or OCR. Adding faxes, text files, scanned documents and virtually any OLE object, including spreadsheets or voice recordings, is then as simple as "drag and drop" into a folder or document I.C.E. has created.

Only MI<sup>3</sup>MS 3000 and I.C.E. can do all this within our imaging system, creating a single "compound document" that seamlessly retrieves all of the relevant information needed. Then fax, e-mail, annotate or print documents with laser clarity — all on one economical, customizable and scalable system.

See why I.C.E. is another way to melt your information problems.  
Call 1-800-9-MINOLTA

MI<sup>3</sup>MS 3000 I.C.E.  
The Image of  
Information Management



Copiers  
Cameras  
Faxes  
Digital Systems  
Document Imaging  
Camcorders  
Binoculars

Only from the mind  
of Minolta





# SIEMENS

ROLM Communications



©1995 SIEMENS ROLM COMMUNICATIONS INC. ROLM IS A REGISTERED TRADEMARK OF SIEMENS ROLM COMMUNICATIONS INC.

## IT'S TRANSPARENT. IT MENDS GAPS SEAMLESSLY. AND IT'S JUST TO THE RIGHT OF YOUR TAPE DISPENSER.

The traditional office as we know it is coming apart at the seams. Sales teams are on the road. Managers are working off-site. And more and more of the workforce is telecommuting. But with ROLM virtual office solutions, this transition can be transparent. ROLM virtual office solutions break down the barriers of time, distance and information access. So your employees work together and respond to customer needs no matter

**ROLM RESULTS:  
BRINGING  
WORKGROUPS  
TOGETHER**

where they are. From intelligent voice mail that can place calls to employees on their car phones to wireless capabilities and worldwide fax, we can help your team reach new heights of teamwork. Call for our white paper on how we can break down the walls to create the virtual office and improve your information infrastructure. Not to mention how to close the gap between where you are and where you want to be.

**YOUR PHONE SYSTEM. IT COULD BE THE MOST POWERFUL TOOL IN YOUR COMPANY.**

FOR MORE INFORMATION, GIVE US A CALL AT 1-800-ROLM-123, EXT. 34.



# SATAN scanner: Curse, blessing or both?

By Gary H. Anthes

SATAN is coming to a network near you. That much is clear.

But whether SATAN — the Security Analysis Tool for Auditing Networks — will prove to be a hacker's weapon from hell or a trusted ally of network administrators was a matter of much debate last week.

The SATAN "attack scanner" is one of a handful of software packages intended to probe the networks of Unix computers for security flaws.

SATAN has been under development — and discussion in cyberspace — for more than a year. But worries escalated last week when it was learned that SATAN was among the software purloined recently by notorious hacker Kevin Mitnick. SATAN's authors — a security researcher and a network security specialist — said last week they will distribute beta copies of the code March 15 and make it generally available on April 1.

SATAN's authors said the attack scanner will report information back to the user about poorly configured network services, bugs in systems or network utilities and "poor or ignorant policy decisions."

"SATAN has succeeded with ominous regularity in finding serious holes in the security of Internet sites," the authors said in a recent Internet newsgroup posting.

Although the authors of attack scanners insist the

tools are intended to help users beef up the security of their networks — and indeed they are used for that purpose — critics charge they are more likely to be used by those with less altruistic motives.

"SATAN will be used by the black-hat community more than the white-hat community," said Eugene Schultz, deputy program manager for the International Information Integrity Institute at SRI International in Menlo Park, Calif. "The Internet is fundamentally unsafe. Now we have another danger element introduced into an already dangerous situation."

## One of a kind

Unlike other attack scanners, SATAN can identify and report even those security flaws for which there are no known protections. "SATAN will open up new ways of attacking systems by those hackers who are dissatisfied with current hacking attacks," Schultz said.

Yet despite the concerns, users swear by the utility of scanners. Ruth Page Jones, a Unix and Internet security expert in Milwaukee, used Bellecore's Pingware scanner at a large client site and found security flaws in 10% to 20% of the hosts attacked. "I was quite surprised to capture a lot of password files," she said.

Worries about SATAN are especially keen because it will be made publicly available via an anonymous Internet file transfer protocol (FTP) site. Similar offerings such as Pingware are subject to careful distribution

controls. For example, Bellecore screens would-be buyers of its scanner, and buyers are advised to install it on a secure machine where root access is required to run it.

"I think the people who run these things need to be extremely careful," Jones said. "I kept it encrypted on my machine."

Experts said users should have an Internet firewall to repel network scanning attacks. The downside, however, is that a firewall strong enough to keep SATAN at bay would be so strict that it would also block many legitimate user requests.

And not all security experts are alarmed about SATAN's arrival. Eric Schmidt, chief technical officer at Sun Microsystems, Inc., called SATAN a "net plus" for security. He did caution users against installing any software without carefully evaluating it for viruses, Trojan horses and the like, however.

"Like any tool, SATAN can be used for malicious purposes," acknowledged Wietse Venema, SATAN co-author and a security researcher at Eindhoven University of Technology in Eindhoven, the Netherlands. "It is a double-edged sword."

SATAN was developed by Venema and Dan Farmer, a network security specialist at Silicon Graphics, Inc. The two insist that SATAN is intended to boost security by heightening user awareness of security issues. "If you are a company on the Internet and you don't run this right away, that would be a tactical error," Farmer said.

**Charles Babcock warns IS** of the lessons of the Kevin Mitnick hacker case. See page 8.



## Cyber-safeguards

CONTINUED FROM PAGE 1

wrote a draft policy, dated Jan. 20, for internal and external electronic-mail networks. The policy prohibits the following activities:

- Operating a business for personal gain, searching for jobs outside Johnson Controls, sending chain letters or soliciting money for religious or political causes.
- Offensive or harassing statements, including "disparagement of others based on their race, national origin, sex, sexual orientation, age, disability, religious or political beliefs."
- Sending or soliciting sexually oriented messages or images.
- Dissemination or printing copyrighted materials (including articles and software) in violation of copyright laws.

Johnson Controls' policy, which is awaiting possible revisions and executive approval, was prompted by "the explosion of user interest in the Internet," said Thomas McCullough, project leader for electronic messaging.

Employers are concerned about a variety of legal entanglements such as employees' downloading copyrighted software without authorization or sending flaming E-mail messages that could lead to charges of libel or harassment [CW, Feb. 13].

A big fear is that outsiders will view an employee's posting as an official compa-

ny statement. This could open the door for a harmed party to file suit against both the individual and his employer.

Joseph Rosenbaum, a technology lawyer in New City, N.Y., said firms can help insulate themselves by answering three simple questions: Is there a guideline? Do employees know about it? Is it enforced?

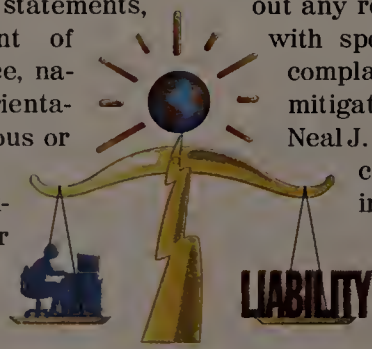
Making an effort to enforce such policies is important if a court is to take usage policies seriously, legal experts agreed. "If it only exists on paper, without any record that it is reinforced with spot checks and action on complaints, I'm not sure it will mitigate the damages," warned Neal J. Friedman, a telecommunications attorney in Washington.

At Eastman Kodak Co. in Rochester, N.Y., E-mail abuse is rare, but there have been some internal

investigations, Robert L. Mirguet, an information security manager, said at a recent conference. "Posting information on [Internet] newsgroups is becoming a problem now because it's going out there with a Kodak address on it, and people get the [wrong] impression that the opinions reflect Kodak's opinions," he said.

When a new Internet account is switched on at Baxter International in Deerfield, Ill., the user automatically receives an E-mail message reiterating the company's policies regarding appropriate use.

The message includes a warning not to use the Internet to transmit sensitive company documents or data. Automat-



## Oh, what a legal web we weave

The American Bar Association will unveil a World-Wide Web site at the end of the month. It will be packed with association information and provide links to legal resources elsewhere on the Internet.

The site, as yet unnamed, will be open to anyone, although the associa-

tion is considering ways to create closed areas for its approximately 370,000 members.

Ironically, because the Web page will not include any new editorial material, its designers saw no need to check its content with the association's legal counsel. — *Ellis Booker*

ing the delivery of the E-mail policy, which was updated six months ago to include Internet E-mail, was necessary because Baxter is preparing to offer Internet access to a larger number of users.

Other companies such as Deloitte & Touche and Monsanto are in various stages of writing E-mail usage policies.

## No one solution

Liability for employee misbehavior stems from a body of corporate law called the "law of agency." It holds that employers are liable for employee deeds if the employee is acting as an authorized agent. The principle also covers job-related actions that appear to outsiders to be authorized.

Many Internet users include a disclaimer when posting to newsgroups saying they do not speak for their employer, but that is only a partial solution.

"The disclaimer will be just one factor that a court will look at. It can't hurt, and it might help, but corporations shouldn't get a false sense of security," said Dan L.

Burk, an expert on cyberlaw at George Mason University School of Law in Arlington, Va.

Employees chattering in cyberspace might be better off avoiding all mention of their employer unless they have the same kind of management clearance they would need to write a press release, suggested Eugene Volokh, a law professor at the University of California at Los Angeles.

Chase Manhattan in New York has a new Internet policy that makes the same point, said Steven Lutz, manager of information security and risk management. Information posted on behalf of Chase must be cleared by the corporate communications office and personal messages must state that the views expressed are not those of Chase.

At Johnson Controls, the draft policy not only requires a disclaimer but spells out exactly what should be in the employee's E-mail signature: the person's name, Internet address and telephone and fax numbers.



# Find the perfect solution for your business and the problem will change.



No company is a stranger to change. Whether or not change is a liability, however, depends on the flexibility of your information system. Therein lies the beauty of Sybase.

We've been the fastest growing company in the relational database industry because of a simple but profound idea: Information systems that adapt to change give your company a sustainable business advantage.

You see, other companies sell you a short-term fix with a long-term drawback. You get locked into doing things their way.

Sybase, on the other hand, solves your immediate needs within an adaptable architecture that's prepared to handle future change.

Sybase further lets you do business your way with a full line of high-performance database servers, development tools, interoperability products, and best-of-breed applications from leading software partners.

That explains why companies like Federal Express, MCI, and Avis have selected Sybase. Call 1-800-SYBASE-1, ext. 6810 to learn more.

It'll be well worth your time. Because tomorrow, everything will change.

**SYBASE®**  
*Architected for Change™*



# DEC avoids Notes face-off

Analysts laud Version 3 of LinkWorks groupware as tour de force

By Neal Weinberg

The latest version of LinkWorks, Digital's Equipment Corp.'s object-oriented groupware, is a technological marvel that could give industry-leading Notes a run for its money, according to enthusiastic analysts.

But Digital apparently prefers to market LinkWorks as an enterprisewide workflow framework targeted at specific vertical industries.

Tom Austin, research director at Gartner Group, Inc. in Stamford, Conn., called LinkWorks Version 3, which will be unveiled Wednesday at GroupWare '95 in Boston, "a technological tour de force." He said Digital should challenge Lotus Development Corp. head-on.

"It's an awesome system," agreed Tim Sloane, director of messaging applications and services at Aberdeen Group in Boston. "Their dilemma is going to be purely marketing the product."

Michael Frow, vice president and chief credit officer at Bank of Montreal's Chicago office, has been using LinkWorks since its earliest incarnation three years ago. He installed Version 3 last weekend.

Frow said LinkWorks has allowed him to re-engineer business processes at the \$100 billion bank without changing the underlying melange of mainframes, servers, PCs, databases and networking software from various vendors.

The bank, which at one time had 44 separate data-

bases, has been able to restructure information around customers rather than bank departments. Not only has the bank cut down the time it takes to process credit applications, but it has also helped employees be more creative in helping customers, Frow said.

But he remains one of a small number of LinkWorks converts in the U.S. The product is more popular in Europe, where it was first developed.

## Notes comparison

Austin characterized LinkWorks as more sophisticated than Notes. Notes is an application and development environment, whereas LinkWorks is an open, object-oriented framework that manages multiple applications, including Notes. But will Digital "be pacifist, or are they going to fight?" Austin asked.

There will not be a direct fight, said Dilip Phadke, group marketing manager for workgroup systems at Digital. "LinkWorks is not a Notes killer," he insisted. "There is no head-on competition."

Phadke said LinkWorks offers "a higher level of integration" than Notes and is being marketed as a framework able to run an entire business in specific industries, primarily manufacturing and finance.

Nina Lytton, president of Open Systems Advisors in Boston, said the latest release of LinkWorks exposes the underlying object orientation, making it easier for businesses and third-party vendors to customize it.

## Digital's missing link

*LinkWorks allows companies to do the following:*

Share information across multiple databases.

Create protocols for reading, editing and managing documents.

Design object-oriented workflow procedures.

Control the activities of numerous workgroups.

Build customized, reusable business processes.

## GroupWare '95 exposes 'process paradox'

Groupware users looking for new directions might just find them at the GroupWare '95 conference and exhibition in Boston this week, where business process re-engineering and workflow will intersect.

Keynote speakers Lynn Knapp of the Coopers and Lybrand Advanced Technology Group and Peter Keen of the International Center for Information Technology will kick off the conference by exposing the "process paradox." They will address the question of why groupware tools that promise a competitive advantage by supporting business process re-engineering may offer significant benefits but often do not deliver bottom-line economic impact, according to show organizers.

Confirmed announcements include the following:

IBM in Armonk, N.Y., will demonstrate business modeling technology, which it plans to

make available later this year. Its services organization is using the software with its Flowmark workflow product, said Bob Schwartz, program manager for workgroup marketing in Somers, N.Y.

Holosoft, Inc. in Los Angeles will announce commercial availability of WorkflowBPR 1.0. This Windows-based tool allows a single user to define business processes by capturing the activities, participants, resources and conditions of a process. Primary and alternative workflows can then be represented visually, aiding in analysis and redesign, according to the company. The product will sell for \$2,495.

Brainstorm Technologies, Inc. in Cambridge, Mass., will add to its suite of tools for developers working with Notes applications by announcing an alliance with Borland International, Inc. in Scotts Valley, Calif. Brainstorm founder Mitchell Liu said developers will be able to

write applications using Borland's new client/server development tool, Delphi, that can access data in Notes databases.

Trax Softworks, Inc. in Culver City, Calif., will release TeamTalk 2.0, a group discussion application. It reportedly allows topics to be broken into threads for better organization and has better navigation tools.

HyperDesk Corp. in Westboro, Mass., will introduce GroupWorks, which dynamically lets users create ad hoc workgroups for projects. Billed by the company as "personal groupware," the desktop application lets users retain individual preferences but participate in a project team to share, coordinate and manage documents, schedules, assignments and tasks. It is aimed at workgroups of two to 15 people. GroupWorks will be available in the second quarter with a suggested list price of less than \$299. — Elizabeth Heichler

## Intersolv offers first 32-bit drivers for Win95

By Elizabeth Heichler

Developers anxious to begin work on applications for Microsoft Corp.'s Windows 95 will soon have access to an important piece of client/server infrastructure: 32-bit software drivers that link desktops to relational databases.

The first 32-bit Open Database Connectivity (ODBC) drivers to hit the market will be available from Intersolv, Inc. through the company's Early Developers Program, said representatives of the Rockville, Md., vendor. The drivers will be generally available when Windows 95 ships.

"We have to start developing now for Windows 95," said Martin Seidell, manager of systems and technology at Metropolitan Life Investment Management Corp. in White Plains, N.Y. "We're really constrained by Windows 3.1, and we need to move to Windows 95."

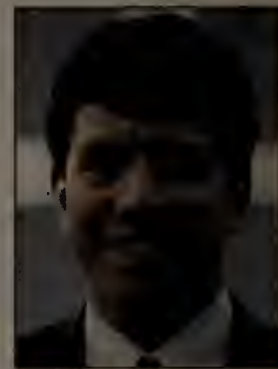
The ODBC drivers from Intersolv will help Seidell quickly connect the extensive array of desktop applications the investment company uses with relational databases containing business information. That will minimize development time and increase his group's productivity, he added.

"The biggest headache I have is making sure that investment managers and portfolio managers — the people who deal with our customers — are working with accurate, up-to-the-minute data," Seidell said.

While Randy Shull, a consultant developing client/server applications for Bankers Trust Co. in New York, does not have an urgent need to work with Windows 95, he said he is looking forward to the 32-bit ODBC drivers from Intersolv because they will boost performance for Windows NT applications. "The ODBC drivers provide a great solution to get to a variety of databases. It makes our life easier. It's a layer we don't have to get into," Shull said. Although he said the bank is still happy with Windows NT, it may begin developing applications for Windows 95 toward the end of June.

Intersolv expects most participants in the Early Developers Program to be software vendors, who are under pressure to support Windows 95 right when it is released.

Protoview Development Corp. in Dayton, N.J., is now readying a Windows 95 version of its development tool ProtoGen+ Client/Server Suite. Engineer Jeff Young said it will integrate Intersolv's new drivers.



Consultant Randy Shull: 'The ODBC drivers provide a great solution to get to a variety of databases'

## Star search

"I'm not looking for Visual Basic and PowerBuilder people. I'm looking for people with a really strong understanding of programming to the Windows APIs," said Martin Seidell, a systems manager at Metropolitan Life Investment hiring Windows 95 developers. Rather than build desktop applications, Met Life's developers focus on middleware to link users to databases, he said.

Consultant Randy Shull at New York's Client/Server Engineering, Inc., will look for Windows 95 development talent around midyear for his client Bankers Trust.

"For Windows 95, I'm looking for much the same skill set, not so much knowledge of the operating system," Shull said. That skill set is "Visual Basic or PowerBuilder... with experience with ODBC drivers, some SQL experience, some report writing experience."



## Big iron

CONTINUED FROM PAGE 1

ware, said Jim Cobban, chief designer for SNA products at Northern Telecom's Ottawa research center.

VTAM is used only in testing compatibility between Northern Telecom's products and IBM's devices, and the software chews up just a portion of the processing resources on a 3090 machine running the VM operating system, Cobban said. "But we're paying license fees for that based on having a very large-scale mainframe," he added.

### MVS expands horizons

IBM plans this week to introduce a version of MVS with expanded Unix compliance and a built-in object class library. Expected to ship in late September, MVS 5.2.2 will qualify for XPG4 branding and include more than 90% of the Spec 1170 set of Unix application programming interfaces, according to an IBM official.

In addition to the cross-industry object library, the new release will have a bundled runtime version of IBM's SOMobjects for MVS object request broker. Distributed object support allowing objects to be shared across a network should be added next year, IBM said.

"Object-oriented technology looks like the wave of the future, and MVS has to get aboard," said Glenn Davis, an MVS system programmer at Seafirst Bank in Seattle.

Hewitt Associates LLC, a benefits consulting firm in Lincolnshire, Ill., plans to bring in a PC Server 500 S/390 to test the feasibility of shifting a pension statistics application off a VM-based Amdahl Corp. mainframe, said Cynthia Overby, the company's network manager.

That would free up the Amdahl system for MVS uses such as testing new applications, said Overby, who is a member of Share's board of directors. She noted, however, that a stumbling block could arise if mainframe software vendors do not lower their usual pricing for the hybrid machine.

Charles Lickel, vice president of business plans and systems architecture at IBM's System/390 division in Poughkeepsie, N.Y., said IBM is putting together a reduced software pricing structure for the server-based models. But other vendors "will have to price it as they see fit," he added.

### Related chips

The board-level mainframe engine, code-named P/390, uses a CMOS-based processor akin to the chip that IBM began shipping last year in a new series of mainframes. Lickel declined to specify the P/390's performance, but sources said it is expected to be similar to the 14-MIPS speed of the earlier chip.

However, throughput "will be very much gated by the I/O structure of the PS/2," Lickel said. As a result, the PC

Server 500 S/390 will be limited to applications that do not impose heavy I/O loads. "It's not the type of thing that we expect to sell tens of thousands of," he said.

"It's not a mainframe replacement by any means because it just doesn't have the I/O," agreed Charlie Burns, an analyst at Gartner Group, Inc. in Stamford, Conn. "But it is a quick and dirty way to distribute an application without having to rewrite it, as long as it can run

within the constraints of the box."

For the past two years, IBM has marketed a similar P/370 processor built around its older System/370 architecture in both the PS/2 and RS/6000 versions. But that device lacks support for MVS and has been sold on a low-key basis to OEM partners rather than to end users.

The P/390 processor will also probably be available in an RS/6000, at least for special bids, Lickel said.

IBM's PC Server 500 System/390 will include the following:

#### HARDWARE:

- PS/2 with 90-MHz Pentium; P/390 board with CMOS-based System/390 chip

#### OPERATING SYSTEMS:

- OS/2 Warp, plus MVS, VM or VSE

#### PRICING:

- Not disclosed but promised to be less than \$100,000

## Developing Client/Server Apps?

### *You need MVS/Desktop!*

Maintenance and enhancement of line of business and mission critical applications in the 90's is a difficult challenge. Command Technology's *MVS/Desktop™* provides an ideal first step in solving your business problems.

The MVS/Desktop family of products provide a Zero Learning Curve solution path to get you up and running fast in new client/server environments, reducing start-up costs and time-consuming training.

#### *SPF/PC®*

Industrial-strength file manager, editor, browser and dialog development environment. Includes full ISPF emulation, powerful multifunction select lists, file type profiling, REXX language, Dialog Management Services, Table Services, ISPEXEC and ISPLINK Support.

#### *SPF/Shell™ for Micro Focus*

COBOL application development through familiar ISPF Foreground and Utility panels. All Micro Focus tools accessed with a standard interface.

#### *SPF/Shell™ for XDB*

Full emulation of ISPF DB2I interface for use with XDB Systems' DB2 emulation product.

#### *SPF/Shell™ for DB2/2*

Full emulation of ISPF DB2I interface for use with IBM's DB2/2 emulation product on OS/2.

#### *SPF/Shell™ for MVS*

Comprehensive read/write access to MVS mainframe files, status info, JES queues, and all MVS control functions.

## For more information on MVS/Desktop:

Call 800-336-3320 or Fax 510-521-0369

**CTC**

Command Technology Corporation  
1040 Marina Village Parkway  
Alameda, CA 94501-1041

MVS/Desktop, SPF/PC and SPF/Shell are trademarks or registered trademarks of Command Technology Corporation. All other products and marks are the property of their respective owners.

*NEW from the makers  
of SPF/PC*



# HP lifts curtain on 64-bit chip, keeps mum on Intel project

By Mark Halper and Jean S. Bozman

Determined not to lose mind share in the processor game, Hewlett-Packard Co. last week provided a glimpse of its 64-bit PA-RISC 8000 architecture, which is still a year from delivery.

At the same time, officials at HP and Intel Corp. all but denied a wire service news report that said the results of the two companies' collaborative microprocessor development would reach the market in 1997 as Intel's P7 chip. That report was based on comments from Intel Chief Operating Officer Craig Barrett, who declined requests last week for further interviews.

## In tune with others

In showing off the next stop on its processor road map, HP is keenly aware that the 64-bit IBM PowerPC 620 and the 64-bit Sun Microsystems, Inc. UltraSPARC are due to ship in workstations and servers this year. But HP is betting that 64-bit operating systems will not be available right away.

"By the end of the decade, under 10% of applications will be 64-bit," said Larry Inman, HP's marketing manager of PA-RISC technologies. "End users don't see the value in it, and standards don't exist in the industry today that support 64-bit chips." He said HP and other vendors will jointly announce a proposal for 64-bit standards later this year.

Inman said HP will offer systems built on the PA-RISC 8000 early next year, although he declined to say whether the first systems using the chip would be workstations or servers. Andrew Allison, an independent consultant in Carmel, Calif., said the PA-RISC 8000 chip

should be one of the Top 2 performing 64-bit chips in 1996.

Analysts noted that 64-bit chips can directly address more than the current 4G-byte limit for 32-bit systems and that a bigger address space will be critical for multimedia and imaging applications. A 64-bit chip is expected to allow large database searches within main memory.

Users said HP's 64-bit chip could help alleviate processing limitations. Jim Banach, assistant vice president of information services at California Compensation Insurance Co. in Rancho Cordova, Calif., said a more powerful processor will cut down on the amount of hardware for his top-of-the-line HP 995 environment.

Jerry Banks, an analyst at Dataquest, Inc. in San Jose, Calif., said that with the PA-RISC 8000, HP "could potentially take a leadership position" in the game of performance leapfrog. Digital Equipment Corp.'s 64-bit Alpha chip currently holds the lead.

Meanwhile, Inman suggested that HP's joint development with Intel is unlikely to yield any products for at least two chip generations.

Inman said HP will follow the PA-RISC 8000 with a model called the 8200 one year to 18 months after the 8000. He could not say with certainty whether the follow-on HP 9000 will be the HP/Intel chip, although he said it is sure to incorporate some Intel design contributions in parallelism. The 9000 will be ready "toward the end of the decade," Inman said, noting the 9000 may be a "placeholder" for the jointly developed chip.

Allison said HP and Intel are leaving themselves wiggle room in case their first attempt at a joint chip does not go as planned.

## Performance boost

**H**ewlett-Packard last week began moving its latest microprocessor, the PA-RISC 7200, into its server line with the unveiling of a series of performance-enhanced HP 3000 proprietary machines. The boxes will also be upgradable to the PA-RISC 8000 when it becomes available early next year.

Sources said that by month's end, HP will introduce a 7200-based HP 9000 Unix series as well. A workstation series based on the chip is expected soon. The 7200 marks a leap in performance over its predecessors — the 7100LC and 7150 — through changes that include higher bandwidth, lower latency and more efficient cache management.

HP product manager Andy Jolls said the new HP 3000 9x9KS series doubles the performance of the 9x7 line it replaces in the middle of the HP 3000 collection. The vendor did not release performance benchmarks relative to other brands, however. Using an entry model HP 3000 918 as a comparison, Jolls said the 9x9 provides up to 11 times the performance of that machine.

HP achieved the performance boost by replacing the processor, doubling symmetrical multiprocessing support to four processors and widening the system bus. In other engineering advancements, the company boosted maximum memory from 768M bytes on the 9x7 to 2G bytes on the new system.

Users expressed their customary approval of the power advances.

"We have some development machines that are 9x7s, and there's some possibility we'll upgrade them" to 9x9s, said Jim Banach, assistant vice president of information services at California Compensation Insurance.

The 9x9 series requires the latest version of HP's MPE/IX operating system Version 5.0. It consists of the Model 939 running a single 80-MHz 7200 and four Model 959s running a 100-MHz version ranging from one to four processors.

Prices start at \$84,580 for a 64-user license on the 939, including HP's Image/SQL database. A single processor 959 with a 64-user license and Image/SQL is \$116,580.

—Mark Halper

## Network tools

CONTINUED FROM PAGE 1

across an entire network or any selected network segment.

The same source said Make and CoroNet recently agreed in principle to a partnership deal that will bring their technologies together, through bundling or other means, to help users manage networked applications.

CoroNet Chief Executive Officer Pierre De La Salle confirmed that the two companies are negotiating, and there is a strong interest on both sides in a partnership.

## Key piece of puzzle

Analysts said application management is the missing piece in today's network and systems management platforms.

"Ultimately, network and systems management boils down to applications and why they behave the way they do," said John Rymer, an analyst at Patricia Seybold Group in Boston.

With CoroNet's CMS, he said, users get a high-level view of "conversations that an application has with resources across the network, including routers, links and servers." Network management platforms such as Hewlett-Packard Co.'s OpenView "can't really tell you what's happening

with applications. When an application breaks, they immediately dive down into the links," Rymer explained.

In the future, application management tools may help users directly compare the performance of competing applications. "Users could say to vendors, 'Look, your app is a pig. It's chewing up incredible amounts of resources and it's slow, and I

guess" basis, he added, the Make tool "can do a harder analysis and say this application is or is not going to [negatively] affect your network."

"What matters to users is how business applications are running, and [CoroNet's CMS] gives us a feel as to what users are experiencing at the application level," said Alan Uhlemann, an information systems architect at a major West Coast pharmaceutical company. "It looks like this tool will give us a heads-up long before users call and say an application is slow."

CMS also will be valuable in maintaining service-level agreements with end users who have been guaranteed a certain response time for a particular application, Uhlemann added.

But one CMS user asked for additional functionality to aid in capacity planning.

"Most new applications are replacing existing ones, and we want to find out what the historical utilization is of an application on the network," said Andrew Kamin, head of KPMG Peat Marwick LLP's San Francisco enterprise networking group and a beta user of CMS.

While CMS does look at network application use, Kamin said it "doesn't do a very good job of plotting that over time." He added that CoroNet plans to remedy that problem in the next release of CMS.

Merging ahead	
The convergence of network and application management tools will provide the following:	
■	Real-time monitoring of the way applications use network bandwidth.
■	The ability to compare different applications' response times across the same network link.
■	The use of application libraries, analogous to hardware device libraries, to help users model how specific applications behave on networks.

have the evidence right here," Rymer noted.

Users hailed the ability to watch how networked applications behave.

"We have a lot of customers that want to explore the potential impact that specific applications will have on their networks," said Mark Rodford, a network development manager at Bell Canada in Toronto and a NetMaker user.

Instead of making decisions on a "best

## Microsoft, Intuit trudge forward

Intuit, Inc. last week said it will provide free revised versions of its TurboTax and MacIntax tax packages to fix errors that occur in some tax calculations. The company said less than 1% of users are affected but has set up a toll-free telephone line — (800) 224-0948 — to handle calls.

Separately, Intuit has delayed until May 30 the date by which its acquisition by Microsoft Corp. needs to be approved by shareholders.

In another legal arena, a federal court issued a temporary restraining order to Apple Computer, Inc. that forces Microsoft to stop distributing allegedly infringing code in its Video for Windows Developers Kit 1.1D. Microsoft said it will begin shipping new kits with replacement code shortly.

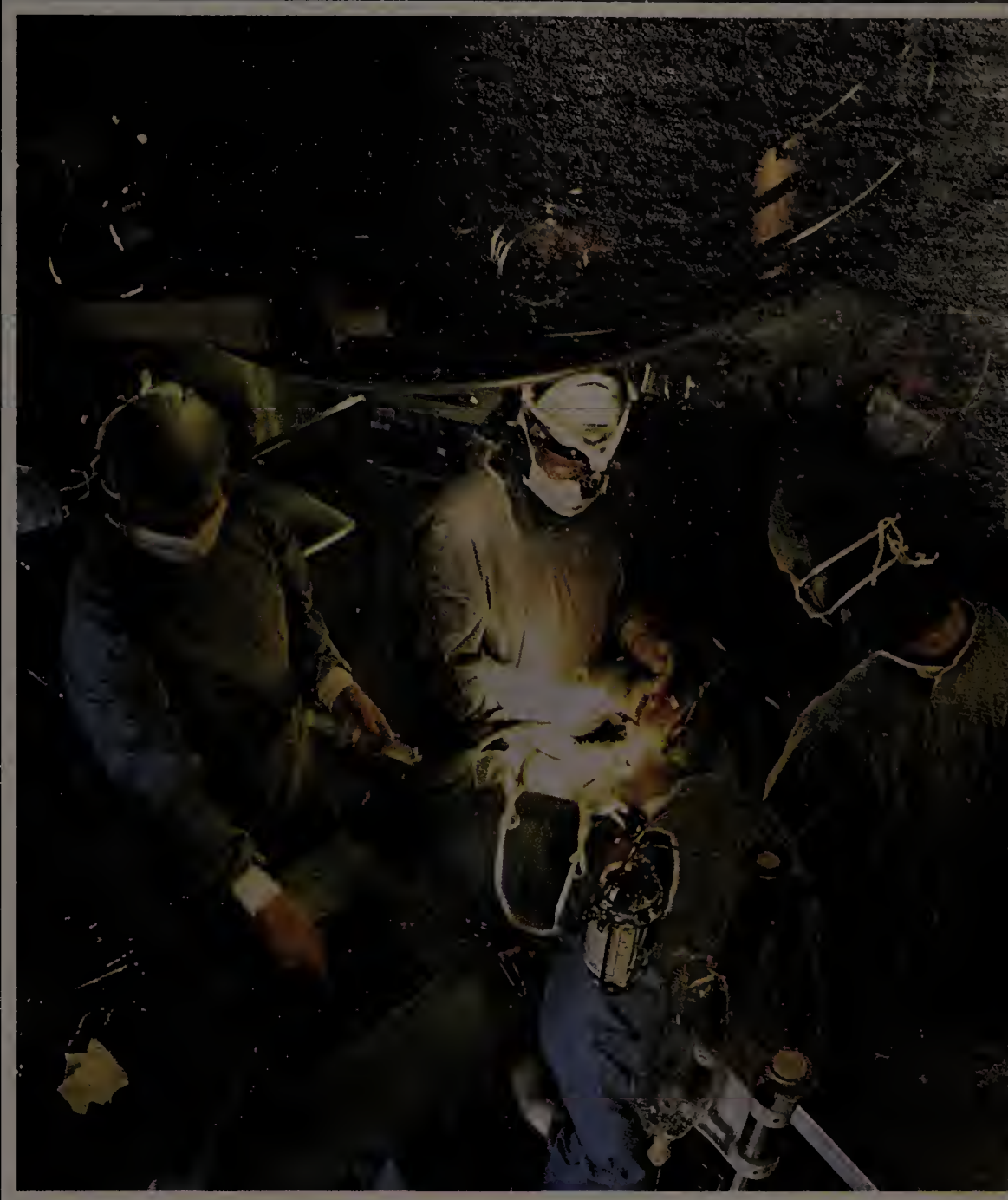
Also, in unrelated news, both the server and workstation versions of Microsoft's Windows NT 3.51 for the IBM and Motorola, Inc. PowerPCs entered beta testing recently. —Stuart J. Johnson



# "EDA/SQL MIDDLEWARE MEANS BETTER REPORTING FOR OUR STAFF AND BETTER HEALTHCARE FOR OUR PATIENTS."



*James Wells, VP and CIO  
Magee-Womens Hospital  
Pittsburgh, PA*



With Informix databases for radiology systems, Gupta databases for labor and delivery systems, C++ databases for laboratory systems, VSAM databases for financial applications, and Shared Medical Systems proprietary databases for hospital information, Magee-Womens Hospital in Pittsburgh boasts one of the most complex information environments anywhere. How does the hospital combine and report from data located in so many heterogeneous file structures and operating systems without hiring a boatload of expensive programmers and application specialists? The answer...EDA/SQL middleware from Information Builders.

#### **INVESTING IN THE RESOURCES THAT COUNT!**

With EDA/SQL middleware, the hospital's doctors, nurses,

technicians, accountants, administrators, and marketers can all use today's most popular front-end applications and reporting tools for transparent access to the information they need, no matter how it's structured or where it resides. So instead of investing in more programming resources, it can invest in superior patient-care and research to better serve the community. Perhaps this is why Magee-Womens Hospital was cited as one of the top 10 hospitals in the nation.

#### **SEND FOR A FREE VIDEO!**

EDA/SQL...the process is transparent, the benefits are obvious. For more information and a free video on how Magee-Womens Hospital and other companies have realized outstanding benefits from EDA/SQL middleware, contact your local Information Builders sales office or call **1-800-969-INFO.**

In Canada Call 416-364-2760



EDA/SQL is the trademark of Information Builders, Inc., 1250 Broadway, NY, NY 10001.

**EDA/SQL®**  
Transparent Enterprise Data Access

## **Information Builders**



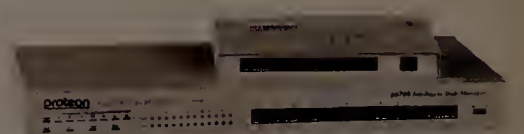
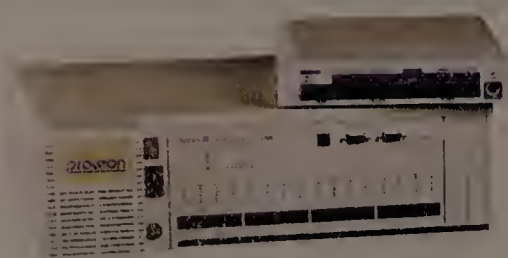


Ethernet doesn't have to be hard.

Not to use.

Not to install.

Not to pay for.



*Build your network from the desktop to the enterprise more affordably, dependably and easily with ProNET/E switches, hubs and adapters.*



Ever notice  
how **easy** it is

when a  
**pro** does it?

**Easy to use** Finding reliable Ethernet products at the right price is now a slam dunk. Introducing Proteon's new easy-to-use ProNET/E™ family of Ethernet products. Our standards-based switches will extend the lifespan and improve the performance of your existing network as well as offer high speed connections to the backbone. Our very manageable and flexible hubs deliver powerful solutions for your workgroup or enterprise network needs. And last, but not least, we offer the best value in full-featured, high quality Ethernet adapters available. **Easy to install** Installation of all Proteon Ethernet products is a snap. For example, our switches install readily with no configuration required. Reliability is guaranteed. Hubs and switches come with a one year warranty that

covers all repairs and replacements free of charge. Adapters are backed by the industry's most aggressive lifetime warranty.

**Easy to pay for** The cost of all this Ethernet excellence? For the same price, or less, of the no-name brands, you can have the performance, dependability and interoperability of Proteon. What's more, combined with our award-winning line of Token Ring products, you now have a one stop connectivity source for your current and future networking needs. So make it easy on yourself. Call Proteon at **800-545-7464** or your reseller to find out more about our new Ethernet products. And show the world how a pro does it.

**proteon** network  
with the **pro**™



# Cairo to 'Avail' itself of storage management

By Tim Ouellette

Users may get a better look at what hierarchical storage management (HSM) can do for PC LANs with the release of Cairo, the next generation of Microsoft Corp.'s Windows NT. Avail Systems Corp. in Boulder, Colo., has agreed to provide

HSM functionality that will be embedded in the operating system.

Avail said it will port its current NetSpace HSM product for Novell, Inc.'s NetWare LANs to NT later this year.

The NT features will be so basic, Avail's product will be positioned as the upgrade path for HSM on NT LANs.

HSM software automatically moves less frequently used files from primary storage on a server to secondary optical or tape-storage devices that are less expensive. The software also lets users directly access these files without waiting for support personnel to restore an older file from primary backup.

The Microsoft/Avail pact helps draw attention to a market that is still in its infancy. "With Microsoft coding to Avail's product, you have a reliable HSM standard," said Robert Wight, president of Avail. "This is something worthy of spending the time to evaluate."

While most mainframe systems users

## SUNWORLD '95



Where else can you learn how to put it all together and get the knowledge to manage complexity? Or see the latest products and services from Sun? Or share experiences and expertise with thousands of other users of Sun®, SPARC®, Solaris™ or complementary open systems technologies? Where else but SunWorld '95, the best source for the knowledge and information you need to compete in today's world of open systems technology.

**Moscone Center • San Francisco**  
**Conferences: May 23-25**  
**Exposition: May 23-25**  
**Tutorials: May 20-22, May 26-27**



### Putting it All Together for You at the Biggest SunWorld Yet!

- SunWorld Expo • SunWorld Conference Program
- The Solaris Developer and Networking Conference
- Sun Educational Services Tutorials • SunSoft Education Courses

#### 4 Easy Ways to Get More Information

**MAIL:** Send this coupon to: SunWorld '95,  
c/o Mitch Hall Associates, 260 Milton Street  
Dedham, MA 02026

**FAX:** Fax this form to 617-361-9074

#### INTERNET:

**MOSAIC on the World Wide Web:**  
<http://www.exporeg.com/sunworld>

**Email:** [sunworld@exporeg.com](mailto:sunworld@exporeg.com)  
[solaris@exporeg.com](mailto:solaris@exporeg.com)

For general information and a registration form please put "Info" in the subject field and your email address in the body of your message. For any other inquiries, simply send us a message and place your email address in the body of your message.

**PHONE:** Call 800-265-3585 for more information.

### SunWorld '95

#### Please Send Me More Information

- ☐ 3-day SunWorld Main Conference Program and Exhibits  
☐ The Solaris Developer and Networking Conference  
☐ Please send me more information about exhibiting at SunWorld '95

Name \_\_\_\_\_ Title \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Phone \_\_\_\_\_ Fax \_\_\_\_\_ Internet/Email \_\_\_\_\_

Computerworld

#### Storage tip sheet

Administrators should evaluate the following when considering HSM:

- High network operating system memory to service disk drive storage, as opposed to tape or optical media
- Bus bandwidth
- Backup hardware
- Labor costs associated with managing file backup and restore

Source: International Data Corp., Framingham, Mass.

regularly use HSM, analysts said the PC LAN market needs to be educated. HSM will be a viable option for storage management when administrators recognize "that the cost of managing storage is more expensive than just purchasing a disk drive, and that the people cost of managing networks is far greater," said Paul Mason, an analyst at International Data Corp. in Framingham, Mass.

Stan Sorensen, a product manager in Microsoft's Business Systems division, said users have asked for native storage management tools for Cairo to help them move from mainframes to distributed environments.

#### Port support

The native HSM functionality in Cairo will provide support for only one layer of storage and one storage device. For users who want more functionality, Avail's NT port will add support for multiple devices and layers. It also will work with the data stored in the existing devices and provide services for a variety of servers, including NetWare servers.

Because Cairo will feature an object-oriented file system, future Windows NT servers will be able to migrate objects within a file separately from the file itself, saving both time and LAN bandwidth.

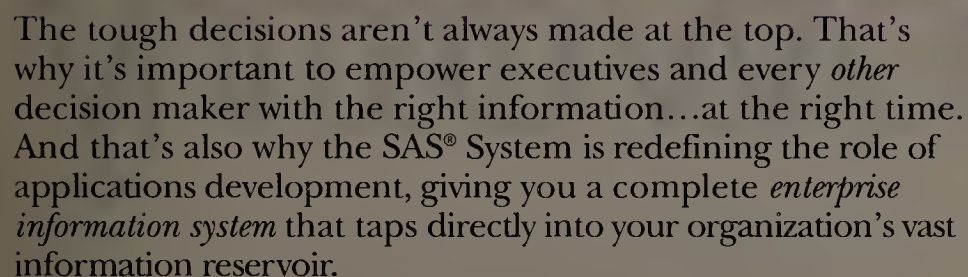
But will basic functionality give users a large enough taste of what HSM can accomplish?

David Cappuccio, vice president and research director of network technologies at Gartner Group, Inc. in Stamford, Conn., predicted more users will want HSM with more than one tier. A better alternative for Microsoft would be to bundle the full Avail NetSpace for NT product in Cairo, he said.

He added that many users would like HSM to be combined with backup rather than made available as an add-on product. Currently, backup vendors Palindrome Corp. and Cheyenne Software, Inc. provide integrated backup storage and HSM products for NetWare and plan to release NT versions.



**For EIS Delivery  
and more...**



With the SAS System, you can build custom-tailored applications in far less time, using fewer resources, than it takes to force-fit an off-the-shelf solution into *your* organization. And because the SAS System has its own built-in strategy for client/server, you can integrate data and applications from different hardware platforms into a single, company-wide information delivery system.

Build applications that incorporate pull-down windows...access to electronic mail...drill down, hotspotting, and exception reporting...and graphical display of critical success factors. Working hand-in-hand with these basics—out of sight but always at the ready—are literally hundreds of powerful, proven tools for virtually every decision support need: financial planning and modeling, corporate reporting, quality improvement, and much more.

Let the SAS System help you reach the right decision about applications development, EIS, and every other issue important to your business. Call us now at **919-677-8200** for a free video preview...plus details about a no-risk software evaluation and upcoming SAS System business briefings.



SAS is a registered trademark of SAS Institute Inc.  
Copyright © 1994 by SAS Institute Inc.



Spend  

---

less.



Worry  

---

less.





**INTRODUCING THE NEW  
64-BIT ALPHASERVER FAMILY.**

Now if you want screaming 64-bit RISC performance and unequalled scalability, you'd be smart to spend less. And buy one of our amazing new AlphaServer™ systems. You'll also worry less, with their fortress-

like reliability features and the best server warranty in the industry.

But you won't settle for less. The AlphaServer family offers you over 6,000 UNIX™, Windows NT™, and OpenVMS™ applications. They also support industry-standard PCI hardware options and handle more

I/O throughput,

more internal

storage, and more

memory. In fact, the only thing they don't give you more of is cost.

You'll have to go elsewhere for that.

Call your Digital Business Partner or 1-800-DIGITAL.



	ALPHASERVER 1000 4/200	ALPHASERVER 2000 4/200	ALPHASERVER 2100 4/200	ALPHASERVER 2100 4/275
PROCESSORS (SMP)	1	1-2	1-4	1-4
TPS	Up to 285	Up to 400	Up to 660	Up to 850
SPECINT92	135.8	131.8	131.8	200.1
MAX SPECRATE_INT92	3,136	6,178	11,892	15,470
I/O SLOTS	2 PCI, 7 EISA, 1 both	3 PCI, 7 EISA	3 PCI, 8 EISA	3 PCI, 8 EISA
MAX I/O BANDWIDTH	132MB/s	132MB/s	132MB/s	132MB/s
MAX MEMORY	512MB	640MB	2GB	2GB
MAX INT. STORAGE	14GB	16GB	32GB	32GB



Just don't  
settle  
for less.





# Baan's manufacturing applications go graphical

By Rosemary Cafasso

Baan Co. is emerging as the dark horse that could snag a lead position in the client/server applications market.

This week Baan will make its next big push for manufacturing customers with the launch of Triton 3.1, a set of manufacturing and financial applications that

will include a graphical user interface (GUI) for the first time.

Initial support for Triton will be available for Windows-based clients and Unix-based Motif front ends.

Founded in Ede, the Netherlands, in 1978, Baan recently opened a U.S. headquarters in Menlo Park, Calif. While virtually unknown in the U.S. market a year

ago, the vendor has recently grabbed several high-profile accounts from bigger rivals such as SAP AG and Oracle Corp. Recent customer wins include The Boeing Co., Northern Telecom Ltd., Snap-on, Inc. and Allied Signal, Inc.

Baan also competes with manufacturing and financial software providers such as Computer Associates Interna-

tional, Inc., Dun & Bradstreet Software, Marcam Corp., J. D. Edwards & Co. and Ross Systems, Inc.

Customers and industry analysts said Baan's selling points are a full-blown client/server implementation, a suite of applications and a long history in the manufacturing business.

With the addition of Release 3.1, Triton uses a three-tiered client/server architecture. The design includes separate data management and application logic on the back-end server, with presentation services managed by the client.

Among other things, this design reduces network traffic because the application logic no longer sends instructions to the client.

"It wasn't as much the functionality that really sold us, but the business concepts they embedded in the software," said Steve Feller, a procurement specialist at Boeing in Seattle. Boeing plans to eventually support 15,000 concurrent users on Triton.



## Big on Baan

Erik Keller, an analyst at Gartner Group, Inc. in Stamford, Conn., said he expects Baan to be a major client/server player. The firm employs 1,000 employees worldwide, up from 800 last March.

"They understand how to build complex systems," Keller said. "They've been able to grow and become more sophisticated."

Kenneth Senn, a project leader in the laminate systems business unit at Allied Signal in LaCrosse, Wis., said his company recently selected Baan over SAP and Oracle because it had more "deliverable functionality."

"We wanted an integrated suite for manufacturing," Senn said. "Their dynamic scheduling and distribution requirements planning were very important to us. The others either weren't ready or were going to provide it through partners."

The introduction of Triton 3.1 is considered a key step for Baan, in part because the GUI will replace a character-based front end that was so "homely... only a mother could love it," quipped Bruce Richardson, vice president of research at Advanced Manufacturing Research, Inc. in Boston.

Scheduled to ship this month, the release is a quick follow-up to Triton 3.0, which was rolled out at the end of 1994. Triton 3.0 included several functional upgrades, including multisite support and a set of financial modules.

In addition to the GUI support, Triton 3.1 will come with boosts to the core client/server architecture, said Ian Williams, director of product marketing. The company redesigned the presentation services as separate code from the application logic sitting on the server.



## IT'S NOT HOW MUCH YOU READ.

You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of *Computerworld*.

As the only weekly newspaper for IS professionals, *Computerworld* is filled with up-to-the-minute articles on topics ranging from products and people to trends and technology. We cover it all — PC's, workstations, mainframes, client/server computing, networking, communications, open systems, languages, industry news, and more.

It's everything you need to know to get an edge on the competition.

That's why over 140,000 IS professionals pay to subscribe to *Computerworld* every week. Shouldn't you.

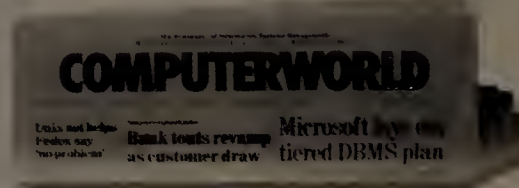


## IT'S WHAT YOU READ.

Order *Computerworld* and you'll receive 51 information-packed issues. Plus, you'll receive our special bonus publication, *The Premier 100*, an annual profile of the leading companies using information systems technology.

Call us toll-free at 1-800-343-6474. Or use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld*.

Then you can spend less time reading about the world of information systems. And more time conquering it.



The Newspaper of IS



**"INFORMIX-NewEra is exactly the type of client/server development environment developers need to create production-level applications."**

**Judith Hurwitz**  
President, Hurwitz Consulting



Free Hurwitz Report.

# Introducing A New Era In Application Development.

**Shipping Information**

Package Customer Tracking Language

**Global Package Express Information**

Ship Date: 06/05/1994 Package ID: 20367

Ship From		Ship To	
Company	Creative Designs	Company	Jenny Bean Co.
Contact	Mike Xavier	Contact	Jenny Morgan
Address	40 Beach Street	Address	2323 Super Lane
City	San Diego CA 94327	City	Mountain View CA 94033
Phone	619-327-4576		

**Tracking Information**

Ship Date: 06/05/1994 Package ID: 20357

Ship To: Jenny Morgan Weight: LRG Ship Type: GEN

Ship From: Mike Xavier

Date	Time	Description	Employee	Status
06/05/1994	13:00	Origin Point	Bob Jones	ON TIME
06/05/1994	14:00	Delivery Van	Jill Watkins	ON TIME
06/05/1994	16:00	San Francisco	Alan Jones	ON TIME
06/05/1994	19:00	Boeing 737	Jack Watkins	ON TIME
06/05/1994	21:00	Los Angeles	James Dean	DELAY

**INFORMIX-NewEra is designed for creating mission-critical, enterprisewide client/server database applications—the kind used to run your business.**

Application developers who have moved to graphical development tools are learning a painful lesson: while prototyping is fast and easy, it's another thing to try to deploy enterprise applications.

Sure, applications built using the first generation of graphical client/server tools *look* great. But ultimately, they don't have the power to scale up to enterprisewide client/server solutions.

Introducing INFORMIX-NewEra™, the second generation. NewEra has beauty *and* brains. All of the graphical tools you expect are there, backed up by an object-oriented development environment designed explicitly for creating mission-critical, enterprisewide client/server database applications.

**Peter Kastner, Vice President, Aberdeen Group:**

**"INFORMIX-NewEra is an excellent product that understands both the client and server sides of application development."**

NewEra's next-generation features include visual programming tools, an industrial-strength object-oriented language, interactive debugger, compiler, repository, and support for team development on Windows or UNIX. It's client/server ready, and it will support open connectivity, so you can use NewEra with non-Informix databases, too.

**Jeff Papows, Notes Product Division, Lotus Development Corp.:**

**"INFORMIX-NewEra offers Notes users the ability to build enterprisewide, client/server applications that extend the value of Lotus Notes."**

Complex applications can be developed quickly, using class libraries provided by Informix and our partners. In fact, Informix has already signed up a number of class library partners, including Lotus for Notes, as well as others for imaging, EDI, and more.

**Find Out What's Behind The Screens.**

We'll send you an independent report from Judith Hurwitz, highlighting the limitations of first-generation client/server tools, and the benefits of the second generation. **Send or call toll-free 1-800-688-IFMX, ext. 32 for your free copy.**

**INFORMIX®**



# Since We Introduced COBOL Solutions Have Off-Loaded

**"Nothing else offers  
as much for the money."**





# ced The Complete on, Thousands Our Competition.

From New York to the Netherlands, companies are replacing their incomplete COBOL solutions with the one that's fully loaded. CA-Realia® II Workbench.

The reason is simple. CA-Realia II Workbench is the most comprehensive COBOL client/server solution in the industry. One that provides an unsurpassed list of benefits and features which include:

Feature	CA-Realia II Workbench	Other COBOL Competitors
Fully integrated, intuitive programmer's workbench	✓	
Debug both PC and mainframe-based programs	✓	
Fast compiles and efficient execution	✓	
Complete single-vendor solution	✓	
Supports Windows and OS/2	✓	
Foundation for GUI Client/Server COBOL development with open DBMS access	✓	

*The competition simply can't compete with CA-Realia II Workbench.*

the world's fastest PC COBOL compiler, a GUI editor and an interactive GUI debugger for code executing on a PC or mainframe, and integrated lifecycle management. Plus a COBOL-intelligent program analyzer that's the smartest thing you've ever seen.

**FAME**  
*Awards*  
Awarded the  
Federal Applications  
Medal of Excellence.

What's more, CA-Realia II Workbench includes a complete mainframe CICS emulator for no extra charge. And, all the features of the workbench apply to CICS programs as well as batch.

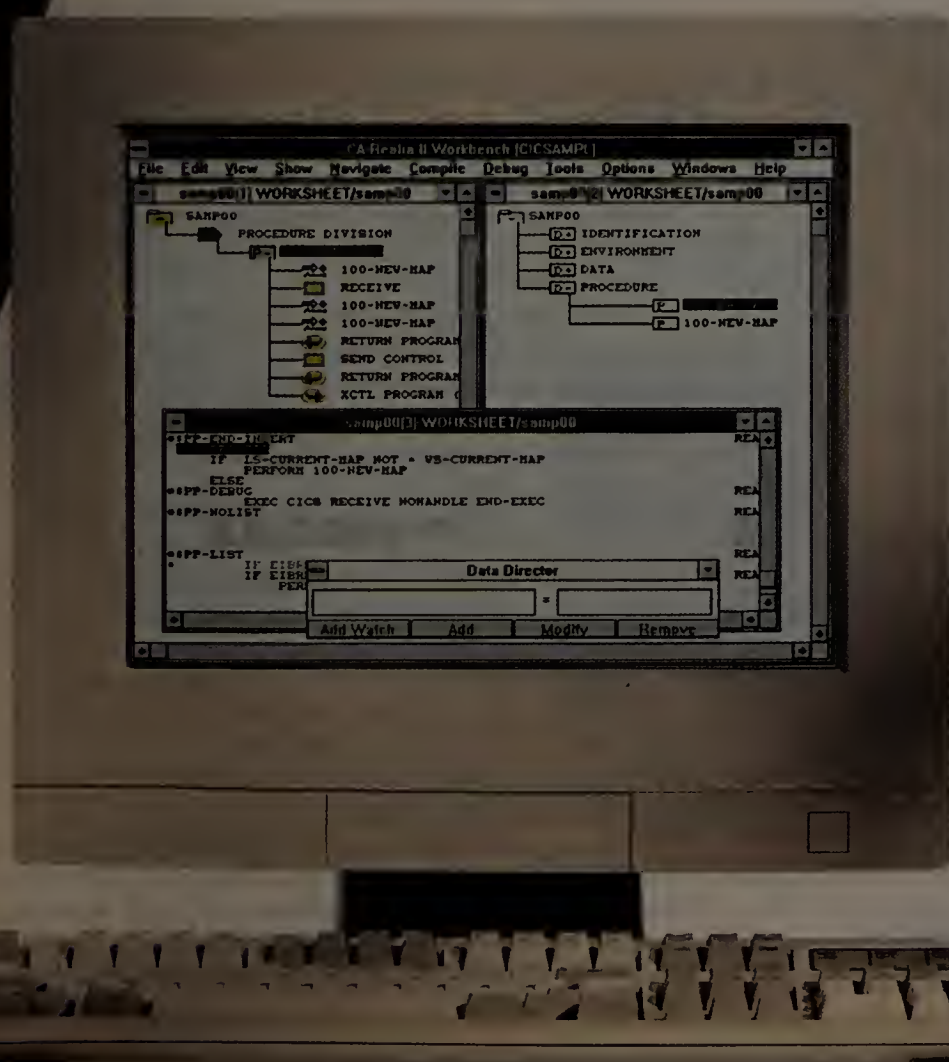
So whether you're in a Windows or OS/2 environment, CA-Realia II Workbench provides complete integration with your host-based systems. Which means unlike some other COBOL solutions, your programming choices are never limited.



**For A Self-Running Demo And  
A Free Copy Of The Secret of COBOL Maintenance,  
Call 1-800-434-REAL, Dept. 26102.**

And join the thousands of companies who've already decided that nothing works better than CA-Realia II Workbench.

**CA-Realia® II Workbench**  
**The Complete Client/Server COBOL Solution**





# ITT Hartford puts pen to work

Fujitsu pen-based system improves efficiency, reduces clerical costs

By Michael Fitzgerald

One of the longest-running pen-based system pilots has finally gone live.

ITT Hartford Insurance Group in Hartford, Conn., began looking into pen-based computing in 1989 only to encounter various waves of immature technology, incomplete vendor offerings and high expectations from users. The company has survived those challenges and expects to outfit all of its 342 risk control workers with pen-based systems by year's end.

Previously, risk control workers were not automated. Their work — helping large purchasers of insurance reduce potential liability — was done manually.

ITT Hartford began piloting its pen project in 1992. After several false starts, it spent a significant amount of time waiting for a workable product.

"If I had thought it was going to take this long, I wouldn't have come in from the home office" to implement it, said Wayne P. Warwick, director of systems development and loss control, referring to the \$2.5 million project's gestation period.

The long pilot involved several factors including the following:

- Underpowered pen hardware and poorly designed software that focused on handwriting recognition.
- Problems deciding how best to use the technology.

• A major enterprise infrastructure shift that affected the potential for the project's rollout.

"Our businesspeople had to ask what was appropriate for our technology, and that used up '92, '93 and '94," Warwick said. The need for better pen technology and a complete shift in ITT Hartford's enterprise computing structure slowed the process.

ITT Hartford uses the Stylistic 500 pen-based system from Fujitsu Personal Systems, Inc. in Santa Clara, Calif., as a desktop. Each employee gets a monitor and

an external keyboard, and each loss control employee gets a software suite that includes Microsoft Corp.'s Office, Lotus Development Corp.'s CC:Mail, Delrina Corp.'s WinFax Pro and Aha Software, Inc.'s Inkwriter. Shiva Corp.'s LANRover E. is used for connectivity.

"It's the world's most expensive yellow pad" of paper, Warwick joked. But it will pay for itself in reduced clerical costs, he added.

"What we're buying right now is the communications," Warwick said.

With computers, risk control reps eliminate the need to dictate reports to stenographers.

So far, one office with 11 workers uses the system. Next Monday, two more offices with another 20 people will receive the system.

And by October, 85% of the risk control workers are expected to use the pen-based system.

ITT Hartford's project is the type of undertaking pen-based technology was supposed to serve when it was touted as the hottest thing since sliced bread and before it turned into burned toast.

"It's a 'check the boxes, don't work with handwriting' application," said Andrew M. Seybold, editor of the "Outlook on Computing and Communications" newsletter in Brookdale, Calif.

Warwick said the long haul has been worth it. "I'm starting to feel pretty good that we're going to be delivering benefits that I know will accrue from this system to my customers," he said.

But down the road, hardware upgrades could be dicey. Few hardware makers are manufacturing pen-based systems larger than personal digital assistants, and one of them, Toshiba America Information Systems, Inc., has scaled back its pen-based business.



ITT Hartford's Wayne P. Warwick is glad to have a pen-based computer in hand after a six-year pilot

## Packing it in

Fujitsu added wireless communications last week to its 2.8-pound Stylistic 500. One version will contain a Proxim, Inc. RangeLAN2 adapter. Data transfer rates can equal 1.6M bit/sec. at distances of up to 500 feet indoors and 1,000 feet outdoors.

# Lotus suite delivers runtime version of Notes

By Rosemary Cafasso

Lotus Development Corp. in Cambridge, Mass., is expected today to launch a new version of NotesSuite, its workgroup and desktop applications bundle, that will contain the long-awaited runtime version of Notes.

NotesSuite: Desktop Edition for Windows will include the latest desktop applications, packaged as SmartSuite 3.1, integrated with a slimmed-down version of Notes. This Notes version does not have application development functions but can be used as a basic platform to run Notes applications.

## Worth the wait

The runtime version of Notes was announced in January as a separate product and began shipping in February for about \$155 per user.

"It brings the price down, and we've been really waiting for it," said Lew Davison, division director at the Missouri Department of Transportation in Jefferson City, Mo., of the NotesSuite: Desktop Edition offering.

"Up until now, we've had to put in developer capabilities with all Notes clients and with NotesSuite," Davison added. "This gives us the capability to target our developers differently than our business users. That's a big plus."

Davison purchased about 800 copies of NotesSuite, which was introduced in late 1994 with complete Notes capabilities. Last week he said he could expand NotesSuite to another 3,000 end users now that a runtime version is available.

At \$399 per user, in volume purchases of 50 or more users, NotesSuite: Desktop Edition is about \$100 cheaper than the full-blown NotesSuite.

# Data General plays catch-up with imaging strategy

By Neal Weinberg

Although late to market, Data General Corp. is moving aggressively into the imaging business with a catch-up strategy that bundles existing technology and sells it to open systems users with large databases.

Last week, DG created a separate imaging business unit headed by William Zastrow, a five-year DG veteran with 20 years of software marketing experience. The Westboro, Mass.-based company will come out with a new version of its AV Image software next month.

The creation of the separate business unit is significant because it shows DG is serious about selling imaging software beyond its installed base, said David Yockelson, program director at Meta Group, Inc. in Stamford, Conn.

"They are viewed as a latecomer," said Michael Goulde, an analyst at Patricia Seybold Group in Boston. "But in some ways that's an advantage."

Instead of investing in developing its own technology, DG essentially acted like an integrator, selecting top technologies from a variety of different companies, including two British firms, Staffware Corp. and Trimeco.

DG drove hard bargains with the smaller software companies, offering Staffware, for example, the opportunity for high volume sales in the U.S. in exchange for

a deeply discounted price. That allowed DG to keep the total cost of the package down.

Goulde said DG also made a smart move by taking an open approach. Customers can use Windows-based PCs as well as databases from Oracle Corp., Sybase, Inc. and Informix Software, Inc., plus servers from IBM, Hewlett-Packard Co., Digital Equipment Corp. and Sun Microsystems, Inc.

## Reducing costs

One of DG's users is Brigham Young University in Salt Lake City, which has taken its student financial aid and admissions records — some 1 million documents a year — paperless with a DG imaging system.

Roger Goodrich, assistant dean of admissions and records, said the project has been up and running for about a year. So far, the 30,000-student university has been able to eliminate eight full-time people who filed and retrieved documents, Goodrich said.

The university plans to eventually bring imaging technology to the billing and financial record-keeping functions as well, he added.

Thomas Kouloupoulos, president of Delphi Consulting Group in Boston, said DG is skipping the low-end commodity part of the market and targeting large enterprise applications.

"They have to work hard to overcome the fact that

DG is not perceived as a leader in workflow imaging," Kouloupoulos said. "They don't have immediate name recognition" like industry leader FileNet Corp. in Costa Mesa, Calif.

That was not an issue for Dona Ana County in New Mexico, however. The county is now scanning all of its clerk's office records — from marriage licenses to property deeds — into a DG imaging system that can be accessed by court personnel, ordinary citizens and local title companies from PCs in their offices.

Peter Cooper, information systems director for the county, said the system has allowed the fast-growing county to avoid hiring

extra people. And it has improved efficiency because the clerk's office does not have to send copies of documents to other county agencies, and everyone on the network can access documents more easily.



William Zastrow must overcome late entry to imaging market



# RAD → ROI

*Rapid Application Development*

*Return On Investment*

## Introducing Delphi

Redefining the fundamental relationship  
between you and your business

### The fastest way to the fastest applications

If you program... you have to see Delphi.™ You'll quickly see how its breakthrough combination of the world's fastest optimizing native code compiler, visual Rapid Application Development tools, and scalable database technology will give you a tremendous Return On Investment. And set you on the fast track to client/server and Windows 95.

### RAD: prototype to production

Delphi's sophisticated visual design and debugging tools help you develop faster. They make it easy to work interactively with your customers, so your final .EXE will fit their needs, increase their productivity, and make you a star! But faster development cycles are just the beginning. The Delphi compiler produces applications that run 10–20 times faster than P-code interpreters. Royalty-free executables let you deploy fast, so you can crunch through the applications backlog in record time. And just wait until your users experience the speed of your delivered apps—they won't want anyone's apps but yours.

"It's going  
to change our  
lives!"

J. D. Hildebrand,  
*Windows Tech Journal*

"Particularly  
for larger  
applications,  
the  
performance  
gains can be  
substantial  
over  
Visual Basic,  
PowerBuilder,  
SQLWindows,  
or similar  
applications  
development  
environments."

Susan Ryan,  
*InfoWorld*

### Delphi Facts

	Delphi	PowerBuilder	VB Pro
Native code compiler for high-performance applications	✓	—	—
Creates standalone, redistributable .EXEs and DLLs	✓	—	—
No runtime interpreter DLL required	✓	—	—
Fully object-oriented programming language. Provides optimal code reuse	✓	—	—
No external tools necessary to build new components or extend environment	✓	—	—
Combines high-performance compiler, visual environment, reusable components, and scalable database tools	✓	—	—
Robust exception handling	✓	—	—
ReportSmith® "live" data reporting	✓	—	—
Local ANSI SQL-92 engine for server independent client/server development	✓	✓	—
Client/server version available	✓	✓	—

### Reuse your components

Delphi's Visual Component Library (VCL) helps you minimize coding, accelerates project completion, and simplifies corporate standardizations. You get a gallery of 75 reusable forms, project templates, dialogs, buttons, multimedia controls, and more. Or add your own reusable objects, DLLs, VBX controls, or OLE 2.0 servers into Delphi's open, integrated, component-based development environment.

### Smooth scaling to client/server

Delphi has a built-in ANSI SQL-92 server, Paradox®/dBASE® access, and ODBC support. So you can rapidly develop full client/server applications on your desktop. Then, by upgrading to Delphi's Client/Server edition, you can quickly deploy applications across the entire enterprise with high-performance native drivers for Oracle, Sybase, MS SQL Server, Informix®, and InterBase®. And all the work you do in Delphi today will be fully compatible with Delphi's forthcoming 32-bit, Windows 95 release. Put RADical performance to work on your bottom line today.



"Development  
costs are  
coming down  
by 50%  
(because we  
can reuse  
code)."

Art Hill,  
VP Cash Management  
Systems, First National  
Bank of Chicago

"The capabilities  
of Delphi  
are endless..."

Jerry Coffey,  
Paradox Informant

"Its  
performance  
edge will be  
considerable."

Paul Bonner  
Windows Sources



**See your reseller or call today. 1-800-336-6464, ext. 9837**

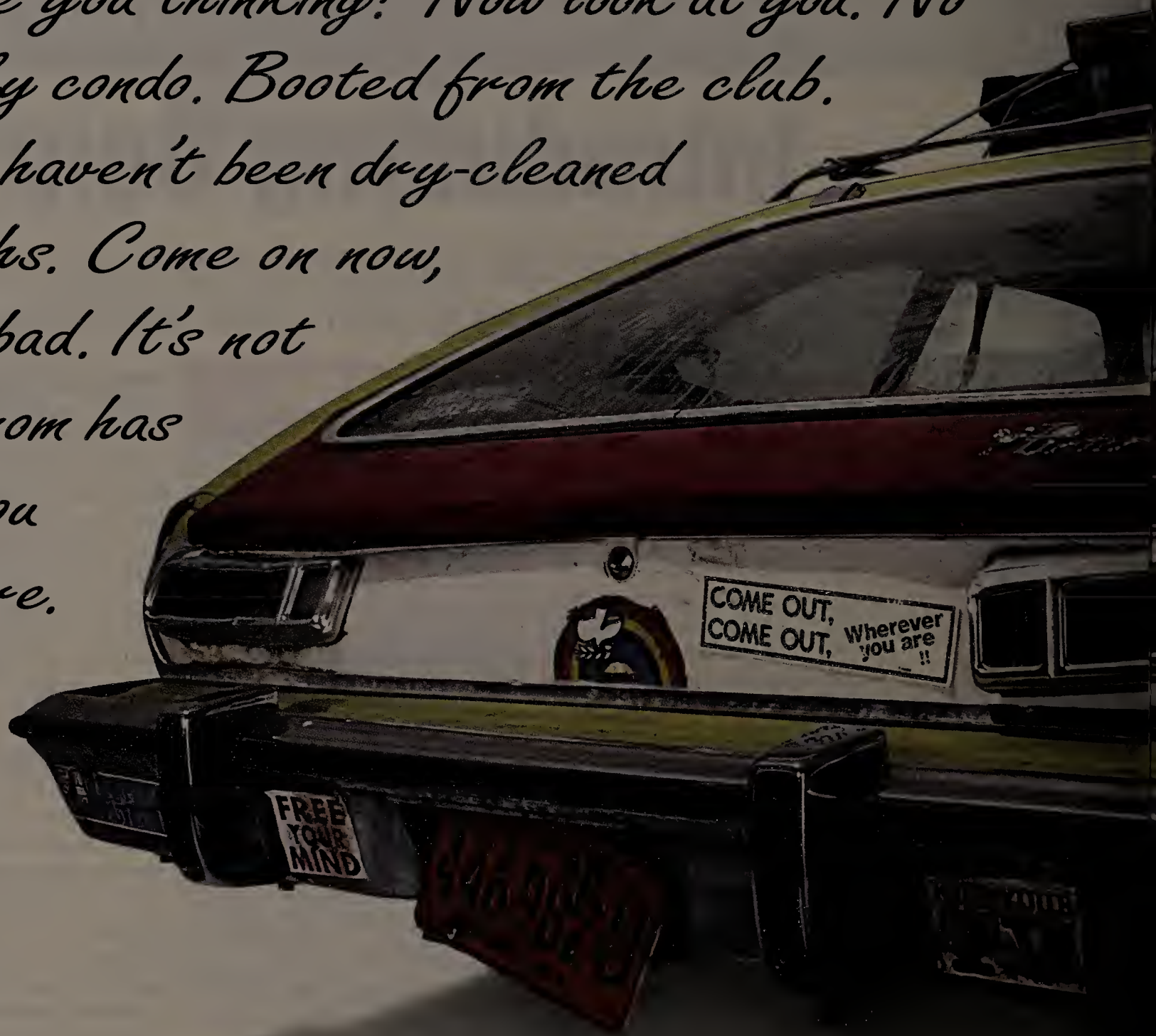
In Canada, call 1-800-461-3327

## Borland

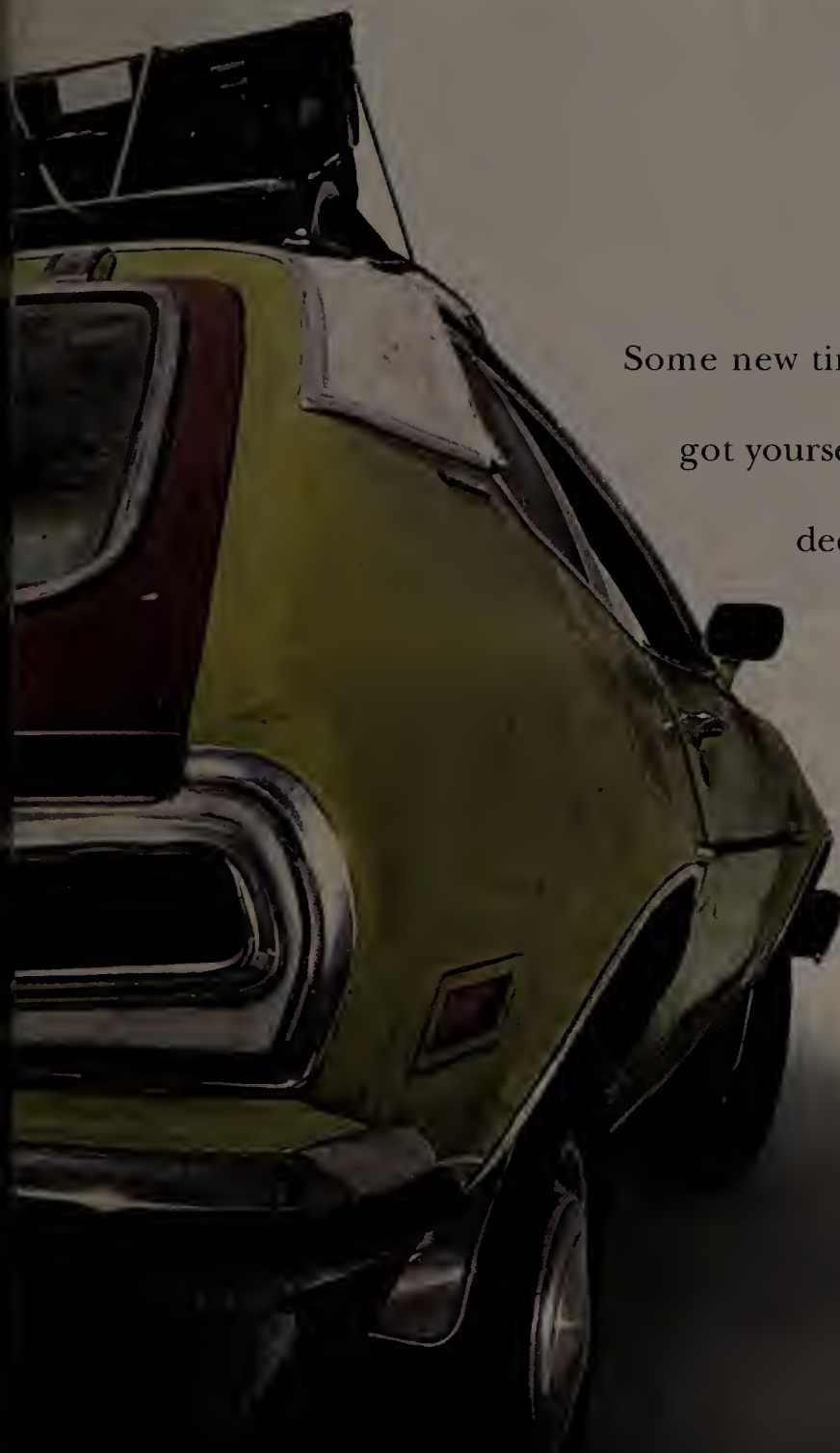


You were a legend. But you just had to choose a system with a Pentium<sup>™</sup> processor instead of NEC's MIPS RISC. You run Windows NT.<sup>™</sup> What on earth were you thinking? Now look at you. No more swanky condo. Booted from the club.

Your suits haven't been dry-cleaned in six months. Come on now, it's not so bad. It's not like your mom has to drive you everywhere.







Some new tires, maybe a fuzzy steering wheel cover, and you've got yourself a spiffy ride. Hey, no one said life is fair. Perfectly decent people make mistakes that unravel their perfectly

decent lives. Mistakes like choosing a Pentium or PowerPC™ system to run Windows NT. Well there is a way to avoid the heartache of vinyl bucket seats. Get your hands on as much information about NEC's V<sub>R</sub>-Series MIPS RISC microprocessors as quickly as possible. Here's some of what you'll learn: NEC's 200

MHz V<sub>R</sub>4400™ runs Windows NT nearly three times as

fast as the 90 MHz Pentium processor. Look, we've

got plenty more to say. So call

NEC Electronics Inc. at

1-800-366-9782 and ask for

Info Pack #182. Pretty soon, you'll

be haggling with those snazzy

dressers at the new car dealership.



# NEC



© 1994 NEC Electronics Inc. Microsoft and the Windows logo are registered trademarks and Windows NT is a trademark of Microsoft Corporation. Pentium is a trademark of Intel Corporation. All other registered marks and trademarks are property of their respective holders.



## Briefs

### Piracy on the rise

The Software Publishers Association (SPA) estimates that 49% of the business software worldwide in 1994 was pirated, a 14% increase over the previous year. The SPA estimated the global PC software industry lost roughly \$8 billion in 1994 due to illegal copying of business application software.

### NetWare 4.1 booms

Sparked by a big ramp in NetWare 4.1 shipments, Novell, Inc. posted earnings of \$82 million in its first fiscal quarter, ended Jan. 28. Revenue rose to \$493 million, a gain of 8% over the same quarter a year earlier. NetWare 4.1 shipments accounted for almost 30% of NetWare revenue for the quarter and are expected to be the lead source of NetWare revenue by year's end.

**SHORT TAKES** Marco Landi, most recently president of Texas Instruments Europe, is now president of Apple Computer Europe... Visigenic Software, Inc. has promoted Mark Hanson from executive vice president of sales to president and chief operating officer... Martin Clague, general manager of client/server computing at IBM, and Douglas Solomon, director of corporate development at Apple Computer, Inc., have joined Kaleida Labs, Inc.'s board... Chantilly, Va.-based Genicom Corp. plans to acquire Harris Anacom Network Services, Inc. in Dallas... Microcom, Inc. will enter the Integrated Services Digital Network market now that it has acquired Extension Technology Corp... Silicon Graphics, Inc. plans to hire 3,000 employees during the next 18 months, increasing its current worldwide workforce of 5,000 employees... TGV Software, Inc. has announced an initial public offering of 2 million shares of common stock at \$16 per share.

## Netscape keeps on rolling

By Ellis Booker

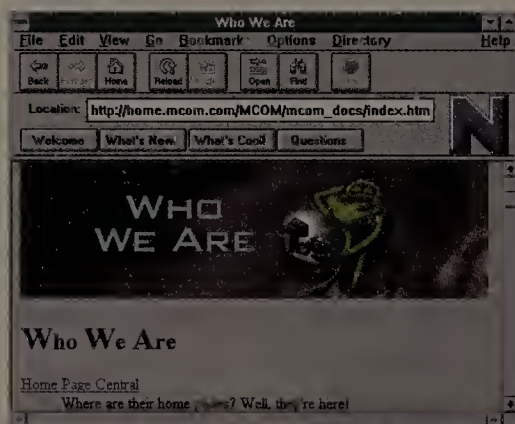
James L. Barksdale bristles at the suggestion that his company "gives away" its wildly popular Netscape Navigator, a graphical browser for the Internet's World-Wide Web that lists for \$39.

"It's only free for educational, nonprofit and evaluation use," said Barksdale, Netscape Communications Corp.'s chief executive officer and president.

Yet Barksdale's objection belies what many say has been Netscape's most canny move: Leveraging a free-for-the-taking piece of client software as a means of selling a server product.

Netscape sells two types of servers. The more expensive of the two, the Netsite Commerce Server, costs \$5,000 and supports Netscape's Secure Socket Layer (SSL). The SSL module works hand in hand with Netscape clients to offer a secure environment to send sensitive data, such as credit-card numbers, on the Internet.

Some 2 million copies of the client software have been downloaded from Netscape's own site (<http://home.mcom.com>) since



Netscape Navigator accounts for more than 75% of browser traffic on the Internet

the product's commercial release on Dec. 15, 1994. The Navigator accounts for more than 75% of the browser traffic on the Internet, according to some Web site statistics.

Netscape officials will not disclose how many supported copies of its browser have been purchased or how many servers have been

sold. The company is similarly tight-lipped about the financial details of its recent deals with companies such as MCI Communications Corp., Novell, Inc., Digital Equipment Corp., BankAmerica Corp. and Delphi Internet Services Corp.

The deals range from ordinary distribution arrangements to more strategic alliances aimed at developing secure Internet-based commercial environments.

Formed last May by James Clark, founder of Silicon Graphics, Inc., the privately held Mountain View, Calif., company quickly wooed away Marc Andreessen and other developers of the original Mosaic code from the University of Illinois' National Center for Supercomputing Applications.

Yet Netscape's high-flying start hardly guarantees its longevity in the fast-paced world of Internet business, analysts cautioned. "I think they've done a terrific job out of the blocks, but this is a market where product life cycles and phases of market development are measured in days not years," said Don Gooding, a research partner at Accel Partners in Princeton, N.J.

Analysts say Netscape faces the following two challenges:

First, its SSL strategy pushes against a competing, open security standard known as Secure HTTP, which the World-Wide Web consortium endorsed.

A more serious worry is what Gooding calls "the arrival of the 300-pound gorilla"—Microsoft Corp.'s Windows 95 operating system. Expected in late summer, Windows 95 will include an Internet browser that uses Mosaic code from competitor Spyglass, Inc.

### Spreading out

A new feature of Netscape Navigator Version 1.1, due out in beta version today and commercially available in April, is an application programming interface for integrating third-party applications via Object Linking and Embedding/Dynamic Data Exchange on Windows, AppleEvents on Macintosh and X Events on Unix.

## PC maker abandons commodities

As fortunes wane, ALR is betting future on high end

By Jaikumar Vijayan

Struggling PC maker Advanced Logie Research, Inc. is turning to the high end to save its bottom line.

Buffeted by PC price wars and almost completely shut out of the mainstream market by much bigger, mass-volume players, ALR had lost its luster as a fairly significant second-tier supplier. Though barely profitable today, the company is not in imminent danger of folding, analysts said.

To escape the "price war bloodbath" at the low end, the Irvine, Calif.-based vendor sharpened its focus on higher margin Pentium-based PCs and symmetric multiprocessing (SMP) systems, said David Kirkey, ALR's vice president of sales and marketing.

With a product line that consists mainly of the Q-SMP series of multiprocessing servers and some high-end Pentium PCs—

including the aggressively priced ALR Evolution series—the company's portfolio is decidedly different from its low-cost "commodity market" days. High-end ALR SMP systems typically start at over \$20,000.

### Short gain

In its last quarter, publicly held ALR eked out a profit of about \$600,000 on revenue of \$45.7 million. Revenue for fiscal 1994 totaled \$183.4 million—an increase of 8.4% over the \$169.3 million reported in the previous year.

"Everyone knows what happened in 1992," Kirkey said. Stunning price cuts enacted by desktop leader Compaq Computer Corp. led to reactionary reductions from other key suppliers. "[Major vendors] moved into channels that we were in and generally created a whole lot of havoc" for us, he said.

"When the pricing umbrella collapsed in 1992, it took down several companies with it," said Eric Lewis, an analyst at International Data Corp. in Framingham, Mass. "It is to ALR's credit that they have survived."

That may be due in part to ALR's decision to no longer compete on price, Kirkey said. Now "we are getting to the safe

ground," he said. Analysts said they support ALR's tactic of seeking solace in the higher margins offered in the server market, where the company is expected to regain some of the price flexibility it lost in the PC market.

### Looking good

Also critical to ALR's survival may be the company's ability to innovate, analysts said. Though not a major player in either market share or revenue, ALR has gained a reputation for being fast to market with aggressively priced products that incorporate cutting-edge technology, analysts said.

These days, the company is trying to leverage some of that experience in the high-end business.

For instance, while vendors such as IBM and Hewlett-Packard Co. have only begun to announce quad-processor systems, ALR has been shipping the ALR Q-4SMP server—including a 100-MHz Pentium version—for several months now.

The company will continue to develop and market PCs, but they will be positioned more as client desktops for ALR servers, Kirkey said.



# I Want a Proven Winner For My Client/Server Financial Needs.

- ☐ Please send your white paper, "Financial Software & Beyond".
- ☐ Please send information about your workflow solutions.
- ☐ Please call.

NAME TITLE

COMPANY

ADDRESS STATE ZIP

PHONE



CLIENT/SERVER FINANCIALS FOR YOUR ENTERPRISE

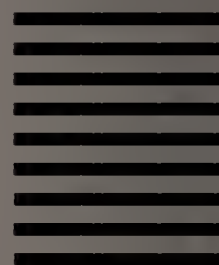
800-828-7660

CW 395





NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS MAIL PERMIT NO. 4 RUTHERFORD, NJ

POSTAGE WILL BE PAID BY ADDRESSEE


**computron**

Meadows Office Complex  
301 Route 17 North  
Rutherford, New Jersey 07070-9860





# Don't Gamble When Choosing Client/Server Financial Software.



## Go With A Proven Winner...Computron.

Smart companies don't take unnecessary risks. That's why Pfizer, like so many other worldclass enterprises, chose Computron for their worldwide client/server financial/accounting system.

Pfizer, a world leader in healthcare, is using Computron's scalable 3-tier architecture to support thousands of accounting and ad-hoc users. And they're using Computron's workflow and COOL products to implement their vision of accounting as action management instead of fixed-point scorekeeping.

Pfizer picked Computron because they know that high performance client/server software needs to be more than just a platform change of 1970s-style accounting with a relational database and a pretty GUI.

Systems for the 90s must transform finance into an enterprise-wide information and action system, where users can access financial and even unstructured off-line data for decision support in ways that are effective and meaningful to them.

Of course, companies like Pfizer wouldn't bet on Computron if we didn't stack up in other important areas as well, like high-end transnational functionality, advanced GUI and development tools, and a truly open 2nd generation architecture that can scale up and deliver, regardless of platform, database, or desktop client type.

### Architecture With Vision

Computron was the first financial software vendor to innovate with workflow/imaging and COOL technology as an integral part of its architecture. As a result, our system can surround and connect your other systems to provide a new dimension in business information management, rather than just workflow-enabled accounting.

Since 1993, IDC reports have shown Computron as one of the top five worldwide suppliers of client/server financial software. So before you bet everything on a big name, learn the facts about the company that is recognized as worldclass in client/server financials.

Call to receive more information and our free white paper titled "Client/Server and Beyond".

# **computron**

CLIENT/SERVER INNOVATION...NOT JUST A PLATFORM CHANGE

## 800-828-7660

ATLANTA • BOSTON • CHICAGO • HOUSTON • LOS ANGELES • NEW YORK • WASHINGTON • HONG KONG • JAKARTA • LONDON • MELBOURNE • SINGAPORE • SYDNEY • TORONTO



## Editorial

## Hackerama

Recently my 11-year-old fixed a vexing problem with the printer on our home system (vexing to me, anyway). I've always been amazed at his ability and willingness to root around my computer and fix things by intuition, while I'd attempt to plow through the manual.

"You're a technical whiz," I told him.

"Don't call me that," he replied, adding proudly, "I'm a hacker. That's what I want to be called."

I asked if he knew what hackers do. He did indeed. "They break into computers," he said.

For some reason I couldn't imagine him saying, "Call me a bank robber" or "Call me a pimp, drug pusher or embezzler." Yet somehow this romantic notion has developed that hackers have a kinship to every good bad guy Errol Flynn ever played, from Robin Hood to pirate Henry Morgan. The incident with my son highlights how this image has pervaded our culture.

That's terrible news for those responsible for maintaining the integrity of computerized information — people such as you. In the past, we've pointed out the grim reality that perhaps no system is hacker-proof. Now, evidence is mounting that the hackers themselves are being widely glorified.

No mistake about it — hackers are not people driven by altruism. They are not messing with your system to feed the poor, end racism, promote world peace or save the environment. Most are driven by an intellectual challenge they issue themselves.

They don't give a damn about the costs their crimes inflict on your company. So what if all business costs are ultimately borne by the consumer? They care only about their own misguided preoccupation.

Some hack purely for profit. As of this writing, my company is cooperating with federal authorities in an investigation of a recent hacking of our phone system. The hackers are believed to have operated a ring whereby phone time on purloined 800 numbers was sold to unsuspecting customers in the New York area.

The hacker subculture, operating under its cloak of anonymity, sings the praises of its brethren's deeds. Nowhere has this act of arrogance and defiance been more apparent than in the case of Kevin Mitnick.

Arrested last month and charged with a string of computer crimes, Mitnick may well have profited royally from his actions. He wasn't out to save humanity. And if he's convicted, I hope he's given a prison sentence commensurate with his crimes. But in the online world, Mitnick is being lauded.

The specter of a long spell in prison is a proven deterrent to crime in general. Let's hope the courts don't share this view of hacker-as-hero.

For my part, I need to have a long talk with my son.

*Bill Laberis*

Bill Laberis, Editor in Chief  
Internet: blaberis@cw.com



## Real people vs. fake people

It was refreshing to read about "real people" ["A dose of reality," CW, Feb. 20]. Please keep reminding the industry that not everyone needs or wants the latest and greatest thing to hit the market. What we want are systems and products that do what they advertise.

Real people never bet their companies on the untried. We are mostly successful because we are state of the practice rather than state of the art.

*Randy Meredith  
Technical manager, IS  
Southeast Michigan  
Council of Governments  
Detroit*

It's a good thing there are still some "fake people" in this industry. While your "real people" seem realistic about solving specific problems, they don't seem to understand that subtle changes in our technology landscape can provide significant opportunities to improve the way we work.

If everyone were a real person, the industry would lack the interest and resources to stimulate the development of horizontally applicable technology.

I certainly understand the necessity of risk management, but burying your head in the sand is hardly an effective way to discover new and better solutions to the same old problems. So I say three cheers for all of the fake people out there.

*Barry Goffe  
Platinum Software  
Irvine, Calif.*

## Staying in-house

Oh dear, yet another opinion column written by consultants extolling the virtues of outsourcing ["The people cost of re-engineering," CW, Feb. 6]. "Many IS professionals are still trying to move from mainframe to client/server." Why is this? Is it because IS professionals are unwilling to make the move or because they are not given the chance?

Characterizing experienced IS staffers as irrational people who "don't want to adapt, change or reinvent themselves" is unfair. I know many ISers who are eager to make the change but are stuck in maintenance assignments. Outsourcing is no panacea. You may find a programmer who already knows C++, but how well does he know your business?

Paying for skills mastery and providing transfer options are certainly fine ideas. Let's just be sure we consider *all* the costs before writing off the in-house staff.

*Elena Germano  
Sterling Heights, Mich.*

system ["Software AG to revamp state tax system," CW, Jan. 30] included the following quote from Donald Feinstein, an analyst at Gartner Group. Feinstein says, "There's no question that Software AG has landed some big contracts, but most of the time they have been selling into their installed base."

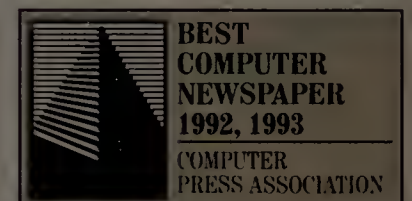
What better endorsement for a company's product than to have its "installed base" continue to seek data processing solutions at its store?

I have supported Software AG products for about 10 years now, and I recently began using some more "modern" SQL-based products.

What a relief to drop back into a system where I can use the Natural programming language to perform my tasks. I can accomplish more in a couple of hours than in a couple of days with SQL.

Just because a product is the latest doesn't mean it's the greatest.

*Charles E. Adams Jr.  
Adams Consulting  
Douglasville, Ga.*



■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

## Software AG fan

The article about the California State Board of Equalization/Software AG of North America project to revamp the California state tax



## COMPUTERWORLD

Editor in Chief  
Bill Laberis

Editor  
Paul Gillin

News Editor  
Maryfran Johnson

Sections Editor  
James Connolly

Assistant News Editor  
Patricia Keefe

Assistant Sections Editor  
Johanna Ambrosio

Technical Editor  
Charles Babcock

Senior Editors  
Craig Stedman, Large Systems

Michael Fitzgerald  
Mobile Computing

Rosemary Cafasso  
Client/Server Software

William Brandel, PC Software

Laura DiDio, Networking

Elizabeth Heichler  
Application Development

Mid-Atlantic Bureau  
Thomas Hoffman, User Strategies

(201) 587-0090

Julia King, Management

(215) 532-7599

Washington, D.C., Bureau

Mitch Betts, Social & Legal Issues

(202) 347-6718

Gary H. Anthes, Government & Security

(202) 347-0134

West Coast Bureau

Jean S. Bozman, Open Systems

Kim S. Nash, Databases

Steve Moore, Networking

(415) 347-0555

Midwest Bureau

Ellis Booker, Networking

(708) 827-4433

Pacific Northwest Bureau

Stuart J. Johnston, PC Software

(206) 641-7770

Senior Writers

Stephen P. Klett Jr.,

Jaikumar Vijayan, Neal Weinberg

West Coast Bureau

Mark Halper, Suruchi Mohan

(415) 347-0555

New Products Writer

Tim Ouellette

Research Coordinator

Stefanie McCann

Features Department

Senior Editors

Michael L. Sullivan-Trainor, CW Guide

Joseph Maglitta, Corporate Strategies

Lory Zottola Dix, In Depth

Allan E. Alter, Management

Kathleen Gow, In Depth

Associate Editors

Jodie Naze, Careers and Marketplace

David B. Weldon, Management

Cathleen Gagne, CW Guide

Senior Researcher

Kevin Burden, Firing Line/Scorecard

Assistant Researcher

Erin Callaway, Resource Center

Special Projects Editor

Bruce Rayner

Managing Editor, Special Projects

Joyce Chutchian-Ferranti

Senior Research Manager

Bob Fink

Chief Copy Editor

Anne McCrorey

Assistant Chief Copy Editor

Christina Aicardi Maguire

Senior Copy Editors

Kimberlee A. Smith, Jill Zolot

Ellen Fanning, Michelle J. Keyo

Copy Editors

Kimberly Gilliard

Jay F. Rizoli, Michelle Grabon

Design Director

Tom Monahan

Senior Graphic Designers

Nancy Kowal

Mitchell J. Hayes

Graphic Designers

Janell Genovese, Mary Beth Welch,

David Waugh

Cartoonist

Rich Tennant

Office Manager

Linda Gorgone

Editorial Assistants

Lorraine Witzell, Connie Brown

Aleksandra Skulte

West Coast Bureau

Chris Flanagan

Computerworld Client/Server Journal

Alan Alper, Editor

Catherine McCrorey, Managing Editor

Mary Brandel, Senior Editor

Stephanie Faucher, Graphic Designer

Electronic Marketplace Liaison

Lisa Davidson

Rights and Permissions Manager

Sharon Bryant

Main Editorial Office

Box 9171, 375 Cochituate Road

Framingham, Mass. 01701-9171

(508) 879-0700

TDD: (508) 428-8244

MCI Mail: 279-6273

CompuServe: 76537.2413

Subscriptions: (800) 669-1002

## Public infostructure needs rethinking

John Diebold

The world's information infrastructure requires refurbishing, but it needs rethinking even more. The private sector and the military have been transformed by information technology, but most public services — from health care to transportation — continue to evade progress.

Areas that must be addressed include the following:

• **Political innovation.** We need political innovation to devise more effective public/private partnerships. Privacy, security and access problems must all be addressed. Politically, one has to provide access to certain services to people who cannot pay for them. How much access should they have, and how do you provide it? Standards, rights of way, radio spectrums, frequencies and liability questions are some issues that must be resolved.

Diebold Institute studies indicate that we need a "facilitating organization." This is one that is part government, part private sector and is charged with clearing away the underbrush. It is a political move, but it also must be sponsored and pushed by business. Bureaucracies don't usually conceive radically new ways to meet needs. Politicians need help creating conditions that attract private sector capital. Many want to do this but do not know how.

• **Financial innovation.** Both the U.S. and the

European Union advocate private finance for infostructure. We need fresh thinking on how to accommodate different levels of risk and nontraditional types of risk. Throughout the history of using technology, the only known fact is that when people have a new technological environment, they do things differently. Who will use the new systems? How much will a user pay for information? What will they use it for? Those unknowns call for demonstrations, models and experiments.

There is a strong argument for some public/private risk sharing during the early years of new types of infostructure. We need financial innovation that encourages government to share the risks and involves corporate funding. One way to equalize the cost of some of these projects is to have tax-free securities or tax holidays on profits.

• **Innovations in research.** Understanding the economics of infostructure requires public policy research. It is common sense that a well-conceived infrastructure allows a society to

improve productivity, but there is little analysis to prove this. Research should address issues such as which conditions encourage and which inhibit the development and deployment of new forms of infostructure.

Instead of continuing to replicate early 20th century system ideas, we need services that are more attuned to individuals, values and

needs. This is a public policy research area that must be included in further technical work in this field.

• **Organizational innovation.** When technology is used to deliver public services, it is used on a departmental basis. This occurs in all forms of infostructure, from health care to transportation. But to revolutionize delivery,

the technology should cut across lines and provide an integrated infostructure service.

Global infostructure is achievable. If we want to enjoy the societal benefits of a 21st century infostructure, we need innovation.

Diebold is chairman of the Diebold Institute for Public Policy Studies, Inc. in Bedford Hills, N.Y.



*Instead of continuing to replicate early 20th century system ideas, we need services that are more attuned to individuals, values and needs.*

## Usage-based pricing: Where the action is

Esther Dyson

When my editors suggested that I write about an interesting new product, I couldn't come up with anything really exciting. Sure, every month we see better report writers, labor-saving asset managers, object-oriented database front ends and whizzy graphics packages, but there's nothing that really changes my view of the world.

In fact, the real action isn't in new products but in new business models. It's how you define the product. An example is a new approach to delivering an existing product, an architectural computer-aided design package called ArchiCAD. The product comes from Graphisoft, based in Hungary and found-

sands of people pay it, but it's daunting to many prospective customers who could also benefit from the package.

The notion of free trials or "lite" versions didn't appeal to Bojar because they have the feel of cheap knockoffs. He didn't want to sell less of a product, but he wanted it to cost less for people who would use it less. That led to Graphisoft's trademarked PayPerUse scheme for usage-based pricing, where a customer pays by the hour.

PayPerUse begins with a \$295 starter kit, which includes the software, a counter (which the software needs in order to run) and the first 50 hours of use. Users can order incremental time with a credit card, at \$3.83 per hour, by phoning an 800 number.

The company has tested it on about 60 customers. Within three months, one-third of them have already become regular users and have generated follow-on revenue. The benefits include more than lower upfront costs: Light users pay less than they would for the full package. Heavy users ultimately pay more;

presumably they are less price-sensitive people who depend on the software as a tool for their daily work. This has a certain equity to it.

Moreover, because revenue continues as customers use the software, the system provides an incentive for dealers (who get continuing commissions) to support their customers in using it. The whole system focuses on use rather than purchase.

From the customers' point of view, there's much less of a start-up investment and lower risk. Even nicer, the customer (frequently an architect or a design firm) can assign the costs to a specific project and bill its client in turn.

As I noted in an earlier column, the customer is paying for intellectual services or processes rather than intellectual property. Of course, it's being measured as time. Bojar, a scientist with a penchant for perfection, keeps trying to think of even better—or more relevant—ways to charge users, perhaps by designs produced, number of rooms created or even per dollar of real estate designed. He considers unit market share to be a specious measure and would prefer to quantify his success in terms of hours of use. It's certainly a better measure of value to the customer, which is what it's all about.

Dyson is president of EDventure Holdings, Inc. in New York. She welcomes readers' thoughts and can be reached at edyson@eff.org.



*The real action isn't in new products but in new business models and how you define the product.*





LEGENT





## Did you say what I thought you said?

☐ Please send me more information about Legent's distributed systems management products and strategies.

Operating systems used: \_\_\_\_\_

Networks used: \_\_\_\_\_

NAME \_\_\_\_\_

TITLE \_\_\_\_\_ DEPARTMENT \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

PHONE \_\_\_\_\_ FAX \_\_\_\_\_

Fax back to 508 836-5643 or call 1 800 676-5468 extension 2506  
and we'll fax you a technical overview the same business day

COME SEE US AT UNIFORM, BOOTH #771.





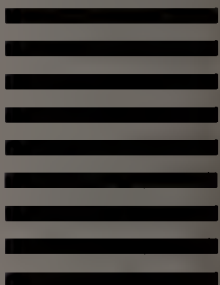
NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**

FIRST-CLASS MAIL PERMIT NO. 1307 FRAMINGHAM MA

POSTAGE WILL BE PAID BY ADDRESSEE

**LEGENT CORPORATION**  
PO BOX 9345  
FRAMINGHAM MA 01701-9527





# It's déjà vu. You've been here before.

The hardware is different. The systems are different. But the problems look awfully familiar. Operations management, resource management, storage management, configuration management, application management, problem management. Doesn't some of this stuff go back to Univac II? And yet, here you are at square one, spending way too much time on the most mundane part of your job. If only there was some management software out there that actually helped. Well, actually, there is. At Legent, we've put together the most extensive set of industrial-strength, distributed systems management tools available. We've also developed an open architecture called XPE that, according to some of the toughest analysts in the business, is pretty remarkable. As a result, our software works together across almost anything you can wire together, regardless of function or platform, from mainframes to UNIX servers to PC LANs. Which means you can manage your systems from the platform of your choice, something our customers tell us has definitely made their lives easier. Think of it: systems management tools that really work. It's déjà vu all over again.

*For a faxed white paper detailing Legent's distributed systems management strategy, call 1 800 676-5468 x2505.*



IBM, SUN, MICROSOFT, NOVELL, YOU NAME IT. TYRUS RUDY IS  
QUALIFIED TO SERVICE JUST ABOUT ANY SYSTEM.

INCLUDING YOURS.

EDUCATION • ASSET MANAGEMENT • PHONE-IN ASSISTANCE • NETWORK DESIGN • SITE PREPARATION • PERFORMANCE MANAGEMENT • FINANCING

SOFTWARE SERVICES • NETWORK MANAGEMENT • TRAINING SERVICES • SPECIAL SERVICES

Tyrus Rudy - Computer Systems Engineer

He's one of over 17,500 HP service specialists worldwide. And no matter what hardware, software or network your system consists of, Tyrus and his team are there to take care of it.

Whatever services you need, you'll find that HP Service and Support has

little to do with our hardware. And everything to do with your system.

HP works on your side.



HEWLETT®  
PACKARD

Service and Support



## Software distribution tools come of age

Users revel in cost savings and speed



By William Brandel

Normally it takes a few months and a concentrated study for users to realize the payback — if

any — on a product they buy. However, that is not necessarily the case for electronic software distribution (ESD) products.

Take, for example, the case of Phil Schulte, network manager at Chicago & NorthWestern Railroad, Inc. in Chicago. The railway invested \$14,000 in inventory management and software distribution products from Frye Computer Systems, Inc. in Boston. The payback was nearly immediate and has been many-fold.

"In the last manual software distribution we did, we had budgeted \$23,000 for the man-hours involved to update the network drivers on the eighth floor," Schulte said. It took five people the better part of three days to upgrade 43 end users.

After installing the new ESD package, Schulte finished the remaining 31 desktops by himself. It took him six hours.

"It was like magic," Schulte said. "Boom, it's on the server, and whap, it's on the users' desktops. All it took them was two minutes to boot their system for the upgrade to be installed."

### Wide appeal

Magic might be overstating the case, but users are finding that ESD technology is a solution to a problem that is only growing. Now that most ESD products have wide-area capabilities, users can install software at desktops in remote cities throughout their company. This was an option many would forgo without ESD.

ESD at the PC LAN level has been designed with users such as Schulte in mind. He works with three other network managers who oversee 900 desktops. Putting out fires takes up enough time, and deploying new applications — let alone upgrades and driver updates — has been a luxury the company could ill afford with its present staffing. You will hear no bad words about ESD in Schulte's corner of the mid-way.

And as software gets more complex, the need for upgrades and updates for interim versions of applications is more frequent. In other words, ESD not only addresses a problem but also allows users to accomplish things they could not do before.

### Desktop distribution

ESD is not necessarily new to users. Many companies have used mainframe- and minicomputer-based facilities to distribute software throughout their sites. However, distributing software to PC desktops is new and represents the fastest-growing section of the ESD market, said Richard Villars, an analyst at International Data Corp. in Framingham, Mass.

"Users who have done ESD at the high end usually have very little understanding of the underlying processes involved with ESD at the PC LAN level," Villars

Electronic distribution software		
Vendor	Product	Price
McAfee	NETTOOLS	\$2,950 for 100 users; \$29 each for 250 users
Saber Software	LAN WORKSTATION 5.0	\$199 for documentation and media; \$59 per node
Symantec	NORTON ADMINISTRATOR FOR NETWORKS 1.5	\$65 per node for five licenses; \$44 per node for 1,000 licenses
Novell	NETWARE NAVIGATOR 3.0	\$995 for 25-user version; \$6,250 for 250 users; \$15,000 for 1,000-user version
Microsoft	SYSTEMS MANAGEMENT SERVER	\$649 for server license; \$50 for each client license

said. "It's completely different."

However, users want it. According to a recent survey by Gartner Group, Inc., a consultancy in Stamford, Conn., more than 80% of users are interested in or actively shopping for ESD products. At the same time, less than 15% of these users

are performing ESD at their sites today.

The disparity of these numbers has to do with the immaturity of the ESD market at the PC LAN level, said Chris Germann, a senior analyst at Gartner Group. With the exception of Novell, Inc.'s NetWare Navigator or Microsoft Corp.'s Systems Management Server, ESD products come largely from LAN utility companies such as Frye, McAfee Associates, Inc. and Symantec Corp. As a result, these products may

strive to address enterprise-level problems, but they still behave like PC-based products. In other words, they are limited to the relatively small amount of intelligence that is built into PCs and PC-based operating systems.

For example, the ESD products on the market offer vastly different approaches to writing scripts. Scripts are an essential component of ESD because they determine how the products deliver the software, which PCs they deliver it to and which application they update. Some of the tools require specific scripting instructions, much like programming, while others use loosely defined parameters.

The scripting issue is a factor because desktop standards are still a goal and not a reality for many sites. Many sites run different versions of different drivers for

printers or networks as well as different versions of applications or even Windows or DOS. To electronically distribute software to a large audience, the user has to write elaborate scripts that will address as many target users as possible.

"As products get more complicated, so do the installations," said Tim Littleton, systems analyst at Southern Company Service in Atlanta. The company uses McAfee's NetTools. "Using ESD still hasn't gotten us to the point where we save as much as we'd like because we still spend a lot of time writing the script."

Distribution tools, page 42

## Concerted effort

Both users and vendors have to address some fundamental problems to bring harmony to their ESD efforts.

• **Desktop standards.** The more homogeneous the desktop environment, the easier it will be to determine whether a certain driver or version of a product needs to be upgraded on any desktop. Standard desktop configurations would also greatly ease the effort involved in writing scripts.

Gartner Group estimates that if a company can distribute one software package to 250 nodes using one uniform script, it can save \$50 per PC in labor hours from its ESD efforts.

• **Desktop software.** Unfortunately, desktop software was not designed with ESD in mind. This is especially true in Windows applications, which load different Windows files in different directories. For example, Dynamic Link Libraries are stored in the system directory, while .INI files are placed in the Windows directory. Users now must write elaborate scripts to ensure all the right software gets to the right place on the desktop or the LAN server.

• **Disconnected from systems management.** Many companies already have high-end ESD products that run with their IBM NetView or HP OpenView console. But like other PC LAN utilities, such as asset management or license management, these utilities do not run with the high-end consoles. As a result, centralized control of ESD is more difficult at large enterprises.

— William Brandel

## On the docket

The following are some of the Corporate Association of Microcomputer Professionals' proposals for ESD:

- **Push vs. pull.** ESD products should include features that not only allow network managers to push software out to desktops but also enable certain end users to pull down software to their PCs.
- **ESD distribution list.** Determining who gets what version of what software is a key feature of ESD. The groupings should include user names or log-in identifications and logical groups.
- **Qualify PC before distribution.** Criteria such as whether the user has enough hard drive space to accept an application, the memory to run it and the correct settings on system files such as CONFIG.SYS or WIN.INI should be discernible from an ESD console. Almost all of this criteria will be addressed by the Windows 95 registry.
- **Automatic suspension.** If the ESD system detects a problem with the PC's equipment, the software distribution is aborted.
- **Scripting features** that can be easily written or edited.

— William Brandel



Task force chairman  
Ki Wilson: "We don't expect a one-size-fits-all solution now"



# Costs keep zoo IS chief with one foot in lion's den

By Michael Fitzgerald  
NEW ORLEANS

The subject of the classic New Orleans tune "They All Asked For You" is a mythical local celebrity so well known that even the animals at the Audubon Zoo ask for him. The song could also be about Mark Andrews, director of information systems at The Audubon Institute. But in this case, it is the staff who does the asking.

"They do all ask for him," laughed Bill Kurtz, the institute's chief administrative officer, who hired Andrews in 1989. At that time, the Audubon Zoo became an institute and needed an IS director to run operations and administration. "We have him a tad overloaded," Kurtz admitted.

That year the zoo was preparing for the 1990 opening of its Aquarium of the Americas. It now also operates a 2,000-acre breeding farm and related facilities and the Louisiana Nature Center. Attendance at the exhibits has more than quadrupled in the past four years. Andrews has the delicate job of supervising IS expansion at a nonprofit organization whose budget has tripled in size but has kept IS spending flat.

"We're not on the flapping edge of technology; we can't afford to be," Andrews said. "My basic rule of thumb is, I don't do things that are going to get me calls at night."

Kurtz is more blunt.

"For us, technology is a necessary evil. If employees could vote to do things on index cards, most would still do so," Kurtz said. "Mark's been able to do a hell of a lot for us. He's been invaluable to the institute."

Kurtz credits Andrews' IS efforts with helping keep hiring low and making workers more productive than they would be without technology. But Andrews has to get more from less.

In fact, most of the institute's workers do their work on dumb terminals that, until recently, connected to a Compaq Computer Corp. 80386-based DeskPro. The institute now has three new Pentium-based ProLiant servers.

The DeskPro was replaced by a 486-based Compaq SystemPro but was not retired. It is now the server for the aquarium's point-of-sale systems, and in its 4½ years of service has had only 30 minutes of unscheduled downtime, Andrews said.

## More with less

Andrews has worked creatively in his budget, using add-in boards and other peripherals from Eden Prairie, Minn.'s Digi International, Inc. (formerly Digiboard) to expand the number of users a given server can support, splicing together code to keep applications running and adding surge suppressors to protect against nasty, system-burning lightning strikes. Despite his budget, Andrews helped make The Audubon Institute

## ON SITE

### The Audubon Institute New Orleans

**Challenge:** To handle business growth while keeping spending down.

**Technology:** Digi International add-in boards and peripherals to leverage older PC and server technology and handle additional users.

**Results:** Quadrupled the number of users while keeping IS spending flat.



The Audubon Institute's Mark Andrews with clients and a souvenir from his father's IBM days

the first commercial user of Integrated Services Digital Network (ISDN) in New Orleans and is now installing fiber-optic cable.

"We got more bandwidth for less money than if we got 56K-bit leased lines," Andrews said of the move to ISDN.

While most users have monochrome, alphanumeric dumb terminals (read: cheap), Andrews is going graphical, thanks to price reductions and the chance

to gain productivity. He is looking to install X Window System terminals and, in some cases, PCs.

But now, the people in the aquarium cashier's office are asking for him.

"He needs to install an upgrade for Carolyn," said Tot DiBenedetto, supervisor of finance. The system works slower than Carolyn Matthews, an employee in the finance office, would like. But DiBenedetto is a fan of the system and said it has improved in the past four years.

"He's responsive. You just sometimes need to light a match under him," DiBenedetto says.

Or cut his fiber-optic cables, which is what happened when a gas line to the zoo's new hamburger stand was installed. Andrews promises the upgrade but then has to head out to check the damage to his new project.

## Animals off-line

The Audubon Institute's Mark Andrews says he does "the same old stuff" except "in a really cool place." Among the perks: petting Suri, the white tiger, swimming in the elephant pool and going for a walk outdoors when he gets frustrated. "The animals don't have log-ons, so you can't get mad at them."

# Microsoft tweaks corporate support program features

By Stuart J. Johnston

Microsoft Corp. has adjusted features of its technical support offerings to make them more responsive to corporate needs. Enhancements include a new program that unifies support for a company on a worldwide basis.

The Premier Global Support program, which will allow corporations to consolidate support for Microsoft products worldwide under a single contract, will be available in July with limited availability in March. The program, which has a base price of \$225,000, frees a multinational company from having to negotiate individual support contracts for each country in which it conducts business.

"We could use [Premier Global Support] NASA-wide with one coordinated contract," said Briscoe Stephens, coordinator for space sciences in the Advanced Scientific Information Systems group of NASA in Huntsville, Ala.

Stephens also applauded another feature of the Premier Global Support program: its annual support plan review. This feature includes two site visits to help customers design, evaluate and implement plans to better support users.

"[One] thing it would do for us is give headquarters an active overview of [what] the various [space] centers are doing to improve interoperability. In terms of a global account, that would be fantastic," Stephens said.

Microsoft has modified its Premier Support plan, which has a base price of \$25,000 per year for 24-hour, seven-day-

## Microsoft's corporate support offerings include the following:

### Premier Global Support

- Single contract (Base price: \$225,000 per year)
- Designated support team (contact people)
- A multinational company can have 10 support contact people worldwide
- Additional contact people are \$10,000 each
- Two on-site visits for planning per year from Microsoft
- Annual support plan
- Unlimited incidents (800 number where available)
- 7-day/24-hour service

### Premier Support

- \$25,000 per year allows for 150 incidents per year (additional incidents cost \$1,500 for 10)
- Designated support team
- Annual support plan
- 7-day/24-hour service

### Support Consulting Line

- \$190 per hour, one-hour minimum, to reach a Microsoft consultant
- Discussion of issues that go beyond technical support

a-week service; users can now call in up to 150 "incidents" a year. Under Microsoft's definition, an incident is a single problem, no matter how many calls it takes to resolve.

"We're moving to a usage-based pricing model," said Deborah Willingham, Microsoft vice president of support, noting that Premier Support used to cost \$20,000 to provide support for 10,000 product licenses. "We had feedback from our large accounts that it was hard to determine deployed base."

The aim is to provide corporate support on a more flexible basis, she added. However, Premier Global Support is not limited to a given number of incidents.

The changes also enable companies that operate on multiple shifts to designate contact persons for each shift who will have access to Microsoft support personnel, Willingham said. That means that a multinational company with a Premier Global Support plan, which limits the number of contact persons inside the customer company to 10, would actually be able to designate 30 contacts if it operated on a three-shift basis — i.e., 10 contacts per shift.

A second program, the Priority Support plan, will also be offered in three options. These will range from Priority Comprehensive Support, which will cost \$3,995 for 35 incidents per year with support for desktop applications, operating systems, development tools and business systems, down to Priority Desktop Support, which will cost \$395 for 35 incidents per year on desktop applications only.

With these programs, Willingham said, a customer can call in on a 24-hour, seven-day-a-week basis. Support for desktop applications between 6 a.m. and 6 p.m. Pacific Daylight Time during weekdays is still free. One other service is the Support Consulting Line, which costs \$190 per hour with a one-hour minimum and enables customers to purchase remote consulting services on an hourly basis.



Macintosh?

Compatible?

I've heard that before.

You wanna show me?



1 in a series

## Macintosh Compatibility


Macintosh: the computer that fits in. Apple® Macintosh® computers can work in virtually any computing environment. They're compatible today. They'll be compatible tomorrow. In fact, the Power Macintosh® 6100/66 DOS Compatible computer has both a PowerPC™ chip and a 486 DX2/66 chip inside. With simply one touch of a key, you can switch from the Mac™ OS to Windows — or DOS — and back again. And every Power Macintosh can run DOS and Windows software with the aid of a program called SoftWindows.™\* So you never have to worry about sacrificing your software investment.

Just plug us in. Apple computers have always worked with plug-and-play simplicity. The sophisticated networking capabilities built into every Power Macintosh support LocalTalk® and Ethernet (including EtherTalk®, TCP/IP and Novell IPX protocols). You can easily add Macintosh computers to practically any kind of network, whether it consists of computers running DOS, Windows or OS/2, or UNIX® stations. Which means you can feasibly consider adding Power Macintosh systems to your company's information system without risk of complications. And you should.

Macintosh: the computer that stands out. At the heart of Power Macintosh beats the revolutionary RISC-based PowerPC microprocessor. It's so fast, in fact, that popular business and graphics applications optimized for PowerPC run two to eight times faster than they ran on any previous Macintosh. Providing the kind of horsepower that recently moved *PC Week* to write, "The speed of the PowerPC processor, coupled with Windows compatibility, is a compelling reason for some customers to move from a PC to a Macintosh platform."\*\*\*

Real people can do real things. Hundreds of native applications are available for the Power Macintosh, programs that bring both familiar and new capabilities to your users. Since Apple has always been a leader in the development of sound, graphics and video, advanced technologies such as multimedia, videoconferencing and 3-D graphics are simply easier to do on a Macintosh. So companies adopting Power Macintosh computers for real benefits today will also find they have a competitive edge tomorrow, translated into lower training and support costs as well as the ability to execute in-house those jobs that once had to be farmed out.

You can now contact us via the Internet. Our Internet address is <http://www.info.apple.com>. Find out how Power Macintosh can easily fit in with your business. And help you leverage the most important power of all. The power to be your best.®

Apple 

The Power Macintosh 6100/66 DOS Compatible runs MS-DOS and Windows 3.11 directly; other Power Macintosh models require SoftWindows. © 1995 Apple Computer, Inc. All rights reserved. Apple, the Apple logo, LocalTalk, Macintosh and The power to be your best are registered trademarks of Apple Computer, Inc. Mac and Power Macintosh are trademarks of Apple Computer, Inc. PowerPC is a trademark of International Business Machines Corporation, used under license therefrom. MS-DOS is a registered trademark and Windows is a trademark of Microsoft Corporation. SoftWindows is a trademark used under license by NeXT from Microsoft Corporation. OS/2 is a registered trademark of International Business Machines Corporation. UNIX is a registered trademark of Novell, Inc. in the United States and other countries licensed exclusively through X/Open Company Ltd. All Apple products are designed to be accessible to individuals with disability. To learn more (1-800-MY-APPLE) or (415) 996-0000, ext. 23, TDD (415) 996-0000, ext. 23.



## Distribution tools

CONTINUED FROM PAGE 39

Without question, a standard desktop throughout a user site would be ideal for ESD. But then, having some standards for ESD products would not hurt either. With this in mind, the Software Licensing Task Force of the Corporate Association for Microcomputer Professionals (CAMP) released working proposals for ESD products (see story page 39).

The goal of the 20 proposals for ESD products is twofold. The first is to give CAMP members a tool for evaluating ESD products. The second

is to let vendors and CAMP members know that vendors are aware of what has been proposed for these products.

"We don't expect a one-size-fits-all solution now," said Ki Wilson, task force chairman and microcomputer manager at Stone Container Corp. in Chicago.

The proposal, developed by CAMP's Software Licensing Task Force, should not be taken lightly by

vendors, analysts said. The last manifesto the group issued was very effective in altering many vendor licensing practices.

Currently, none of the products meet CAMP's 20-point wish list, Germann said.

"CAMP is saying, 'We want the moon, and this is our picture of the moon,'" Germann said. "And now users can say to vendors, 'Your products are either orbiting the moon or have not taken off from earth yet.'"

Of the 20 points outlined by CAMP, the top requirement is for ESD packages to include usable and comprehensive installation, configuration and scripting capabilities, he said.

### Vendors on the fence

Most of the vendors say they will try to comply with the CAMP proposal. However, others say the level of multiplatform support of ESD that CAMP calls for runs contrary to the momentum of certain markets.

For example, CAMP calls for network operating systems to include support for Novell's NetWare, Microsoft's Windows NT Server and LAN Manager, IBM's LAN Server and Banyan Systems, Inc.'s Vines.

"We now support Vines and PC LAN Server in products we sell today," said Russell Frye, president of Frye Computer. "But I can't guarantee that I will do it with all our future products. You can't support everything forever and expect to stay in business."

However, a new product on the market may help mitigate many of the client issues of ESD. Microsoft's Windows 95 will include a registry that will store the basic information required for an ESD tool to determine which version of what software now runs on a desktop. This feature must now be built into each ESD product, and as is the case throughout the ESD market, none do it the same way.

**"As products become more complicated, so do the installations."**

—Tim Littleton,  
systems analyst,  
Southern Company  
Service

# HP sparks interest in infrared

## New LaserJets will become wireless

By Michael Fitzgerald

■ **The first Hewlett-Packard Co. printer to come with infrared data transfer communications technology will appear in April.**

HP will put infrared technology in a new family of printers, the LaserJet 5P and 5MP. In conjunction with a number of PC hardware makers that are building infrared communications into notebooks and some desktop computers, HP's decision to use infrared in a printer may boost overall market interest in the technology.

Analysts have repeatedly said that HP's dominant market share in the printer arena means that its inclusion of infrared will drive significant vendor support. Companies such as IBM PC Co. and Texas Instruments, Inc. already have notebooks on the market that incorporate infrared data transfer. Analysts said more will follow suit this year.

### Red hot market

Infrared "will be hot," predicted Randal Giusto, an analyst at BIS Strategic Decisions in Norwell, Mass. Giusto said the low cost — less than \$5 per system — of infrared technology makes it an easy feature to attach. But he said users so far have been lukewarm about the technology.

### Portable prowess

One factor in favor of putting infrared in printers is the way it works with the portable market. BIS Strategic Decisions estimates that seven of the Top 10 notebook vendors will offer infrared data transfer by this summer.

"The big challenge is to get end users to use it," he said.

HP officials said they expect to see a large number of computing devices containing infrared, although Lutz Marsteller, an HP product manager, said the company is not likely to build infrared into its network printers.

HP's initial target audience — the branch office or home office worker — for the 5P and 5MP makes sense, according to analysts.

"It reflects the transience of today's office worker," said Joel Wechsel, an analyst at Gartner Group, Inc. in Stamford, Conn. Wechsel also said HP was wise to build in the technology even if users need time to accept it. "I'm sure [infrared] isn't the most important thing to happen in printers this year, but it is important for HP to continue to innovate."

Besides serial infrared from the Infrared Data Association, HP built a variety of other features into these products, the first of the LaserJet 5 family. They print at 6 page/min., up from 4 page/min. for the prior generation. LaserJet 4Plus, which targets corporations, prints at a rate of 12 page/min. HP also added a second paper tray and replaced the serial port with an extra parallel port. The new parallel port increases the distance the printer will certifiably

transfer data from 3 to 10 meters.

The new printers ship in April. The LaserJet 5P will cost \$1,109, and the LaserJet 5MP, which adds PostScript support, will cost \$1,299.



**Orchid Technology** has announced NuSound PnP, NuSound CD and NuSound Studio, audio adapters for PCs.

According to the Fremont, Calif., company, NuSound PnP provides 16-bit stereo sound, plug-and-play support, a CD-ROM interface, wave table synthesis and three-dimensional audio enhancement.

The NuSound CD adds a 16-bit SCSI-2 interface and a 1M-byte wave table synthesizer. The NuSound Studio adds digital audio effects, 4M bytes of RAM and downloadable RAM-based wave table synthesis.

Prices range from \$139 to \$259.

► **Orchid Technology**  
(510) 683-0300

**Zoom Telephonics, Inc.** has announced Hotscan and distinctive ring features for its Zoom/Voice FaxModems VFP 14.4V.

According to the Boston firm, the Hotscan feature turns a fax machine into a scanner and lets users scan graphics or images to PCs. Modems with Hotscan are plugged into a phone jack then connected to the fax machine.

The distinctive ring feature distinguishes between fax calls and other incoming messages and can route these calls to different departments. The feature also identifies the speed at which an incoming data call is able to connect.

The Zoom/Voice FaxModems VFP 14.4V cost \$120.

► **Zoom Telephonics**  
(617) 423-1072

**Symantec Corp.** has introduced Mobile Link 2.0, an add-on for its Act 2.04 contact manager.

According to the Cupertino, Calif., company, Mobile Link 2.0 lets information systems managers track mobile users and provides synchronization and security features.

An on-line Electronic Literature Rack lets users selectively pull down longer documents.

Mobile Link 2.0 costs \$100 per seat in units of three seats.

► **Symantec**  
(408) 253-9600

**Modatech Systems, Inc.** has announced Maximizer for Windows 3.0, contact management software.

According to the Vancouver, British Columbia, firm, Maximizer for Windows 3.0 has added Microsoft Corp.'s Object Linking and Embedding support, a word processor, headers and footers, print previewing, graphics support and import/export capabilities.

The product prints in popular address and calendar book formats and includes a "find free time" feature when scheduling appointments. Standard features include customizable contact databases, an appointment hot list, calendars and an audit trail of contact activity.

Maximizer for Windows 3.0 costs \$249.

► **Modatech Systems**  
(604) 736-9666

**Multi-Tech Systems, Inc.** has announced MT2834PCS/C SVD, an internal Industry Standard Architecture bus simultaneous voice and data modem.

According to the Mounds View, Minn., company, Multi-ModemPCS provides 28.8K bit/sec. V.34 technology and was designed for the desktop videoconferencing market. An optional software package includes an answering machine, data and communications and document conferencing software.

The MT2834PCS/C SVD costs \$499, and the optional software costs \$199.

► **Multi-Tech Systems**  
(612) 785-3500

**Logicode Technology, Inc.** has announced Quiktel 14V14PCM PC Card, a voice/fax modem for laptops.

According to the Tarzana, Calif., company, the product provides V.32 bit/sec. data transmission and V.42 bit/sec. data compression and can be used as a voice mailbox.

It features automatic tone or pulse dialing, call answering and answer tone detection. Voice capabilities include up to 999 individual voice mailboxes, password protection, an embedded voice-mode command set and automatic distinction between voice, fax or data transmissions.

The Quiktel 14V14PCM PC Card costs \$249.

► **Logicode Technology**  
(805) 388-9000



# FRANKLY, WE HAVE NO IDEA WHY PC TO ENTERPRISE DATABASE ACCESS IS SO HARD.



*Solaris can make friends with virtually any database*

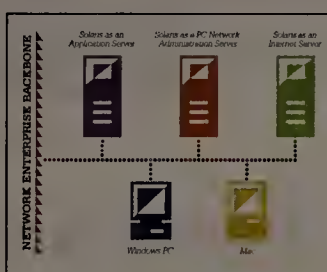
**B**ecause we created the ultimate software environment—Solaris™ x86. **N**ow you can get everything your heart, and your enterprise, desires. **L**ike built-in scalability, multithreading, increased security and well-proven reliability—whether you're running on Pentium™ or x86 platforms. The ability to run the largest databases in the world—like Informix®, Sybase®, Oracle®, Progress® and CA-Ingres®—at truly impressive speeds. And since Solaris



*If it's popular, Solaris probably runs it.*

distributes database applications evenly across all processors in a system, you won't be facing costly software

rewrites. **B**ut Solaris isn't satisfied with just being the top database server—it's also a centralized server for full Internet access and a fully functional application server solution as well. From Novell® networks to Microsoft® Windows applications, Solaris offers Windows



*With Solaris as your application/database, Internet, or PC network administration server, your Windows clients and NetWare® servers will have high performance access.*

users seamless Internet and application access from anywhere on the corporate network. **S**o if you need a strong, dependable database, application or Internet server, then you need Solaris. **F**or



*Solaris improves the performance of your x86 server*

more information, reach us at 1-800-SUN-SOFT, or via the Internet at <http://www.sun.com/>. **S**ee—that wasn't so hard now, was it?

 **SunSoft**



# Oddly enough, the most advanced development tool for Windows 3.1 isn't from Microsoft.<sup>®</sup>

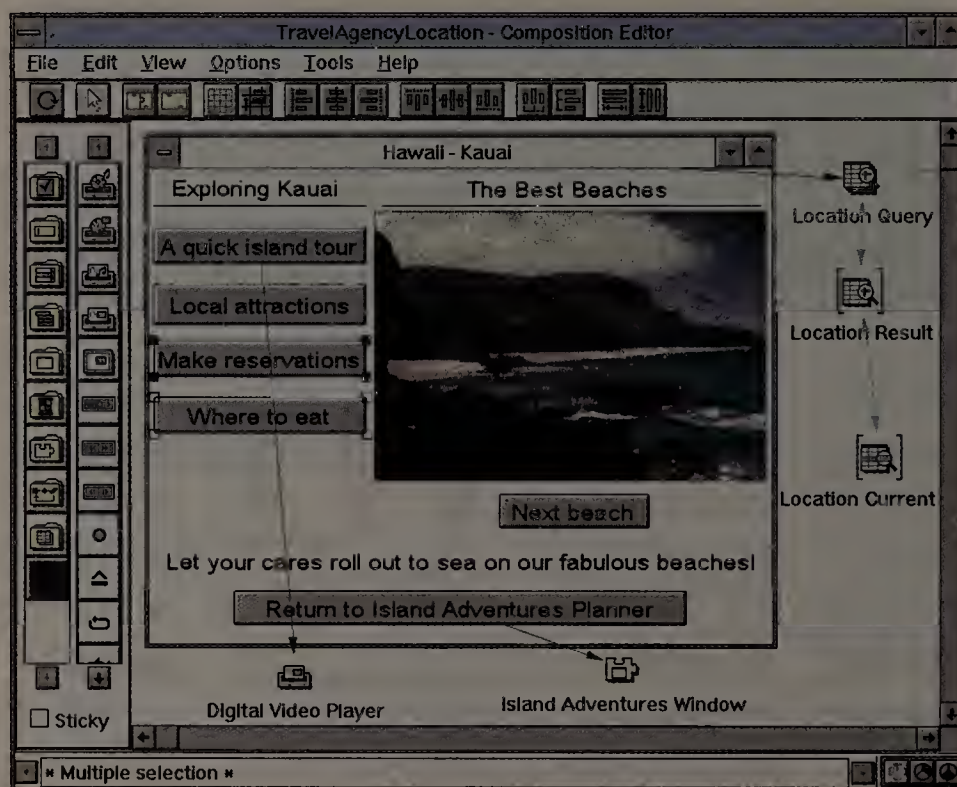
It's never been easier to develop high-powered client/server applications for Windows<sup>™</sup> 3.1.

With VisualAge<sup>™</sup> 2.0, IBM pushes the limits of possibility by combining the simplicity of visual construction with a fully object-oriented development environment.

Mind-blowing multimedia? Awesome apps?

IBM<sup>®</sup> VisualAge 2.0 lets you create powerful and flexible systems with amazing speed.

What's more, you also get the added flexibility



*VisualAge gives you the power to quickly create object-oriented applications through the simplicity of visual development.*

of intuitive GUI tools and IBM Smalltalk.\*

So now it's easier to develop fully portable, standards-compliant applications in a completely integrated environment.

And you don't have to take our word for it.

IBM VisualAge 2.0 was voted 1994's Pick of the Year by *PC Week* and *Datamation* declared it

**Best Product of the Year.**

For a free 60-day trial copy on CD-ROM, call  
**1 800 IBM-2279.**

\*The IBM Smalltalk O-O language, included with VisualAge, is also available separately. Outside the U.S., call (919) IBM-2279 or contact your local IBM office. IBM is a registered trademark and VisualAge is a trademark of the International Business Machines Corporation. Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation. ©1995 IBM Corp. All rights reserved.



## Digital aims Alpha servers at MicroVAX users

By Neal Weinberg

Digital Equipment Corp. filled the gap in the low end of its Alpha line last week with a new server to replace the popular MicroVAX and a workstation aimed at the Unix market.

By shaving some speed off the Alpha chip, Digital was able to come out with an AlphaStation 200 workstation that breaks the \$5,000 price barrier and an AlphaServer 400 that starts at less than \$10,000.

But reaction is mixed on whether the workstation is still too pricey.

Terry Shannon, an analyst at Illuminata in Hollis, N.H., said the workstations are too expensive. "They need something that sells below \$3,995," Shannon said.

"They have not yet elected to get price-aggressive enough to go after the high-volume marketplace," Shannon added. And the company appears to have no plans to drop the price any lower, he said.

"Alpha remains upscale," Shannon said. "While everybody would like to drive a BMW, a hell of a lot of people can only afford Volkswagens."

But Robert Stephens, vice president of sales at Total Tec Systems, Inc., a distributor in Edison, N.J., said he does not see price as a problem.

He said the new Alpha workstation is winning business away from competitors, especially when it comes to technical applications.

"The key thing we're noticing is that in our [value-added reseller] portfolio, Digital is winning market share from competitors," he said. "This is really the first time they've had a high-performance

The AlphaServer will be a big hit with existing MicroVAX customers, predicted Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass.

"It should be a great volume box for all the small distributed sites they always sold the MicroVAX into," Christiansen said. The AlphaServer 400 is ideally suited to run Microsoft Corp.'s Windows NT with an Oracle Corp. database attached to a Novell, Inc. network, he added.

In fact, Matra Data-vision, Inc. in Tewksbury, Mass., is marketing its computer-aided design (CAD) and manufacturing software on the AlphaStation 200 in combination with Windows NT. "The price/performance is super," said Bruce Boes, vice president of technical operations at the company.

Ronald D. Freed, MIS manager at Hatfield Quality Meats, Inc. in Hatfield, Pa., said he is an Alpha believer. He uses the 2100 server for accounting, inventory, order entry and administration at the full-line packinghouse.

"It has been a fabulous box for us," Freed said. So good that the company is

considering purchasing additional Alphas to take on even more of the computing load.

However, Mark B. Bierman, manager of the information systems department at the American Association of Orthodontists in St. Louis, is eyeing a Pentium-based solution. As his VAXcluster winds down, Bierman said he is looking for a replacement, probably in the next six to eight months.

Nick Ruse, marketing manager for Alpha workstations at Digital, said the systems are targeted for uses such as low-end mechanical CAD and financial applications.

The server is aimed at "mission-critical computing at the very low end," said Andrei Shishov, Digital's director of marketing for the Alpha server line. It can be used as a LAN server for file, print and electronic-mail applications or as a

file backup system or application server.

Shannon said the new products extend Peripheral Component Interconnect bus support down to the low end of the Alpha line. And they are upgradable to speedier chips.

Digital's new low-end Alphas

	AlphaStation 200 4/100	AlphaServer 400 4/166
Clock speed	100 MHz	166 MHz
Maximum memory	192M bytes	192M bytes
Maximum internal storage	3.15G bytes	8.4G bytes
Availability	Now	Now
Starting price for Windows NT version	\$4,285	\$9,315

product that was price-competitive in that end of the market."

### Better, not cheaper

The AlphaStation does not beat Sun Microsystems, Inc. on price, said Dominic Ricchetti, an analyst at Dataquest, Inc. in San Jose, Calif. But Digital touts its price/performance.

Ricchetti said Digital is playing catch-up with Hewlett-Packard Co. and Sun, which have built strong momentum in the Unix marketplace.

Digital is pushing the new products through its channel partners in a bid to win high-volume sales.

Digital needs  
"something  
that sells below  
\$3,995. . . . They  
have not yet  
elected to get  
price-  
aggressive  
enough to go  
after the  
high-volume  
marketplace."

—Terry Shannon,  
analyst,  
Illuminata

## LAN standard held hostage by third-party indifference

By Steve Moore

Early users of the Desktop Management Interface (DMI) say they are excited about the new PC LAN management standard's potential but are frustrated by vendors' tardiness in delivering DMI-enabled hardware and software.

If DMI lives up to its advance billing, it will help users put an end to "Sneakernet" PC LAN management. Instead of dispatching a technician to each desktop every time a configuration change is needed, LAN administrators will use automated, DMI-compliant management tools to remotely monitor and configure desktop PCs.

### Support essential

"The DMI is the best idea since sliced bread, but it's not going to mature without broad third-party support," said a senior integration engineer at a major U.S. armed services contractor, who requested anonymity. Unable to wait for more vendors to implement DMI, the contractor is "looking into other configuration management options. We'll put [Microsoft Corp.'s Sys-

### Birth of a standard

DMI provides a standard means by which desktop PC hardware and software components can communicate their system resource requirements to client/server management applications. DMI was developed during the past three years by the Desktop Management Task Force, a consortium of more than 300 hardware and software vendors.

tems Management Server] on NT and Frye Utilities on NetWare and run them against each other," the engineer said.

Because DMI holds the potential to ease users' LAN administration pains, "people are already figuring DMI fairly heavily into their future investment plans," said John McConnell, president of McConnell Consulting Co. in Boulder, Colo.

"Going forward, one of my requirements for anything new that we buy is DMI compatibility," said Samuel Bieber, a network administrator at Omron Health Care, Inc. in Vernon Hills, Ill. "If we can implement [DMI] and improve the reliability and efficiency of our LAN environment without sucking the blood out of users' workstations, I'm all for it."

### Waiting for the other shoe

But other users have their doubts. "We won't commit ourselves to any desktop management standard at this point, and I don't see how we could with Windows 95 coming out with very strong support for Plug and Play," said Steven Shaffer, network manager at Management

Consulting and Research, Inc. in Falls Church, Va., and a user of Intel Corp.'s DMI-enabled LANdesk Management Suite.

Even though Management Consulting has already committed substantial resources to training its LANdesk users, Shaffer explained, he intends to "let the heavies duke it out and see" whether DMI emerges as the primary desktop management standard.

"If this DMI thing is going to fly, let's get everybody on the bandwagon," said Glen Farrell, LAN systems coordinator at Firestone Textiles Co. in Woodstock, Ontario. If DMI had been implemented in the eight Pentium-based PCs his company recently bought, he noted, there would have been no need for him to visit each of those machines just to change a single omitted software setting.

While pioneering users clearly see its value, "I don't believe that the average LAN manager really understands the importance of DMI," said Cheryl Currid, president of Currid & Co., a Houston consultancy. "These guys are so busy putting out fires that they don't have time to think about fire prevention."



# Notes gets Memo as partner

By Suruchi Mohan

As "collaborative computing" becomes the catchphrase in more organizations, vendor companies are tumbling into one another's arms in an effort to woo users with rich offerings.

A recent alliance of this nature was formed between Cambridge, Mass.-based Lotus Development Corp. and Denmark-based Verimotion, Inc. Under the terms of the agreement, the companies will help users integrate their respective offerings — Notes and Memo.

Notes is Lotus' groupware and application development platform; Memo is Verimotion's workgroup computing product that offers electronic mail, calendaring/scheduling, forms and bulletin board services.

## Everyone wins

"This could be a win-win situation for both companies," said Karl Wong, principal analyst for PC and workgroup software at Dataquest, Inc. in San Jose, Calif. "The most impact will be on Memo customers who want or need to migrate. Lotus stands to gain from some minor migration, and Verimotion can claim to support the current leader in groupware. Overall, this announcement will have lit-

tle effect on either company in terms of actual dollars," he said.

Rob Leftwich, business account manager at Norfolk Southern Corp., a transportation company in Roanoke, Va., said his company is looking at Memo's integration with Notes as a way of providing users with another option for workgroup computing. Norfolk Southern has 27,000 Memo users. Novell, Inc.'s GroupWise and Microsoft Corp.'s Exchange are obviously strong contenders, but Verimotion's alliance with Lotus helps Memo.

Leftwich said users at his company, which has only recently begun experimenting with Notes, are keen on application development. None is taking place right now.

To help users integrate the platforms, Lotus will provide technical support for developing interoperability between Memo and Notes, including the ability to use Memo as a front end to Notes. Interoperability will also entail exchanging and synchronizing messages, attachments, directories, calendars and forms.

Later this year, the companies expect to have three components that will ease integration: mail connectivity, directory coordination and synchronization and seamless access between Notes and Memo.

# E-mail put to work for software distribution

By Suruchi Mohan

For the harried network administrator, a product that saves time is a real boon, especially when new products and software upgrades result in a plethora of electronic files to be installed and managed every few months.

WinInstall 4.0, which On Demand Software & Services, Inc. in Naples, Fla., introduced last summer, does just that, according to users. It is priced at \$495 per server.

"Time is a major benefit," said Mark Moore, principal systems support analyst at Samsonite Corp. in Denver.

Previously, when a new user was added to the network, administrators had to copy a template to the home directory and update 10 .INI and icon files. Now they copy a template, start Windows, run WinInstall and put in the group name and sign-up name. WinInstall updates the .INI files and customizes the icon files with the right properties. "What took an hour and 10 minutes now takes 25 minutes," he said.

## Hours to minutes

Time savings, though hard to quantify, seem to be what users find most beneficial. Paul Oppenheim, president of Open Networks, Inc., an integrator in Portland, Maine, estimated that administrators at a 500-user site would save about 41 hours using WinInstall if they normally spent five minutes — a conservative estimate — per workstation for an application set-

up routine. "If you can distribute Windows applications automatically using WinInstall, you've saved one week per [administrator]," he said.

WinInstall has the greatest benefit for users installing software that cannot be set up through the network, said Larry McHaney, technical coordinator at Tomball Independent School District in Tomball, Texas. For example, it would not save any time for an administrator installing a product such as

Microsoft Corp.'s Office, which can be installed from the network, because administrators do not have to go to each individual workstation anyway.

WinInstall is also great for upgrading software to remote sites from the main office, said Michael Roy, a systems analyst/programmer at Advanced Systems Group, a consultancy in Denver. This feature saves money in travel expenses, he said.

WinInstall differs from other software distribution utilities such as Frye Com-

puter Systems, Inc.'s Software Update and Distribution System (SUDS) in that it can be sent to users as an attachment to electronic mail.

"SUDS is a good package but does not have the ease-of-use features that WinInstall has," Oppenheim said. WinInstall does not require a terminate-and-stay resident (TSR) program, which is a big benefit because a TSR program takes up RAM, conflicts with other TSR programs and conflicts with applications, he said.

## Uninstall

Open Networks President Paul Oppenheim said WinInstall's ability to remove any application installation or upgrade it makes at the touch of a button is extremely important because Windows applications are sometimes incompatible with one another.

# Europe prefers Unix over NT

By Cara A. Cunningham

PARIS

The threat posed to Unix by Microsoft Corp.'s Windows NT in Western Europe will be modest, according to the results of an end-user study by market researcher International Data Corp. (IDC) in Framingham, Mass.

"It is evident that Unix and NT will increasingly become competing operating systems," said Lone Poulsen, an analyst at IDC's European Unix Service in Copenhagen, who issued the report. "What seems most comforting to Unix vendors is the fact that users rarely plan to invest in NT at the expense of Unix. Often investments are made in both."

This year, the annual study sampled corporations of differing sizes and industries in France, Germany, the UK, Italy, the Netherlands, Denmark, Sweden and Norway.

In most instances, users said their intention to buy either Unix or Windows NT

did not exclude the other operating system from their plans. Even in the server arena, where Unix and Windows NT are most likely to bump heads, Unix is not "highly threatened" by Windows NT, Poulsen said.

In fact, in the server operating system market, Windows NT poses more of a threat to Novell, Inc.'s NetWare, he said.

Users should note, however, that Windows NT is making some ripples in the Unix world. Of the Western European users surveyed, 18% said the existence of Microsoft's operating system decreases their commitment to Unix, up from 7% last year. Conversely, 3% said the release of Windows NT has strengthened their commitment to Unix.

Survey participants had two pieces of advice for Unix vendors in the battle against Microsoft: Agree on a single, unified Unix, and make Unix easier to use.

Cunningham is Paris correspondent for the IDG News Service.

Announcing a new service from Computerworld:

**COMPUTERWORLD**  
**RAPID REFERENCE**

Get the article you need — when you need it.

Computerworld articles can help you nail down a sale, make a critical hire or get up to speed on an important topic.

- Just call CW Rapid Reference and we'll send you any article from any issue of Computerworld, Computerworld Premier 100, Computerworld Client/Server Journal and Computerworld Campus Edition by fax, overnight delivery or regular mail.
- Search by any name or subject and get just the information you want.
- Prices begin at just \$9 for the first article and \$6 for additional articles. Additional charge for fax or overnight delivery.


call 1 (800) 343-6474, ext.554

**COMPUTERWORLD**  
**CLIENT/SERVER**  
**JOURNAL**

**COMPUTERWORLD**  
**Campus**  
**edition**

**COMPUTERWORLD**  
**PREMIER 100**





## EIGHT OUT OF TEN MICROSOFT CUSTOMERS PREFER LOTUS APPROACH OVER ACCESS.

It's a pretty revealing test.<sup>†</sup> You take people who use Microsoft® Excel and you sit them down to work with Microsoft's database and Lotus® Approach®. You ask them to do the kinds of things you want to do with a database—like track customer orders and report on sales data. You ask them to find specific customer information and analyze the results. And when they are all done they pick Lotus Approach as the easiest, fastest and best—eight out of ten times. It's not surprising. In Approach everything is designed around ease of use—you work with familiar concepts like reports and forms. Microsoft Access™ requires learning programming terms and concepts like "Dynasets" and



### Independent Research Findings

- Microsoft users rate Approach:
- 37% More Productive than Access.
  - 30% More Complete than Access.
  - 36% Easier to Use than Access.

"RowSourceTypes." And, with the new X10™ speed technology, Approach is not only easier than Access, it's faster. According to independent research,\* Approach is faster on common database tasks like finding, sorting and reporting on information. So, why choose Access and give up ease of use for lack of speed? — not a very bright idea.

Lotus Approach is part of SmartSuite®, so you know it has exceptional integra-

tion with 1-2-3® and Lotus Notes®. Call **1-800-TRADE-UP, ext. A637\*\*** to order SmartSuite today for just \$299. And find out for yourself what eight out of ten Microsoft users already know.

**Lotus**  
Working Together®

\*\*In Canada call 1-800-GO-LOTUS ©1995 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142 All rights reserved Lotus, Approach, SmartSuite, 1-2-3, Notes and Working Together are registered trademarks and NotesReady is a trademark of Lotus Development Corporation. Microsoft is a registered trademark and Access is a trademark of Microsoft Corporation.  
†Independent test conducted by User Interface Engineering, North Andover, MA 12 94 \*Comparative Database Query Performance Tests, National Software Testing Labs, December 1994





# BE THE TRUCK. NOT THE BUG.

It's very easy to feel like the bug these days.

After all, more of your company's business is running on-line. So you're more at risk if your computer goes down.

Instead, keep on trucking with a Sequoia system. Our anticipated merger with Texas Microsystems will mean we can make your business unstoppable from the desktop to the mainframe. With exciting new products ranging from environmentally-rugged PCs to fault-

tolerant systems.

## STAY IN THE PASSING LANE.

Sequoia systems are not only fault-tolerant, but also guard your database against corrupted data. Yet the new Series 500 costs about the same as non-fault-tolerant

systems. And provides the communications connectivity and client/server environment you need.

It's also a system that is modular enough to allow you to start small, and grow to hundreds of users, or more, in easy on-line steps.

## A BETTER PICK ENGINE.

Our Pick® implementation is the best available. Bar none. For example, you get the benefits of running Pick in an open UNIX® environment, as well as the ability to access your Pick databases from Windows™ applications.

So call Sequoia today at 800-562-0011 for our white paper *12 Ways to Make Your Business Unstoppable*. And let someone else get that run-down feeling.

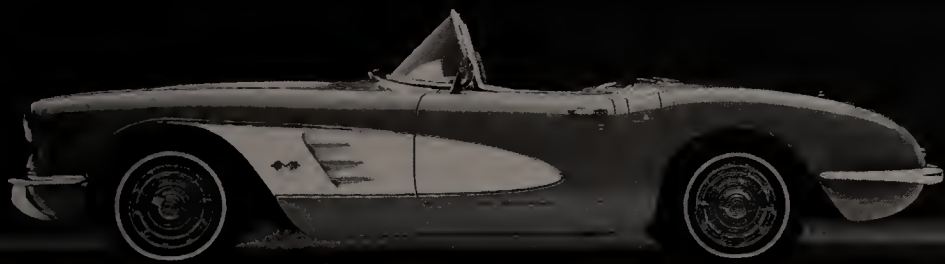
# SEQUOIA

MAKE YOUR BUSINESS UNSTOPPABLE.™



*The new Series 500. Making your business unstoppable has never cost less.*





## This is What Your Monthly Savings With Marathon™ Could Look like.

One of our Marathon customers saves the equivalent of a '59 Corvette every month. That translates to roughly \$20,000.

And while your business may have little use for vintage automobiles, it serves to illustrate a point: you can save serious money with Marathon. Even if you're a small business.

Here's how: if you have several remote locations (two to 250), you can link them with simultaneous voice, fax and data communications over a single phone line. Up to eight channels at once. Typically, you'll save enough to pay

for the Marathon system in under a year. And you'll pocket the savings thereafter.

*Whether you have two or 250 locations, Marathon delivers all communications on one line. Return this card or call for your free brochure today. Find the certified Marathon Distributor in your area by calling (800) MICOM AD [642-6623] or (805) 583-8600. 24-hour fax (805) 583-1997.*

And start planning what you'll do with the savings.

**MICOM®**  
*Products That Pay for Themselves™*

1034



Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
\_\_\_\_\_  
Phone \_\_\_\_\_



NO POSTAGE  
NECESSARY  
IF MAILED IN  
THE UNITED  
STATES



## BUSINESS REPLY MAIL

FIRST CLASS      PERMIT NO. 906      SIMI VALLEY, CA

POSTAGE WILL BE PAID BY ADDRESSEE

**MICOM Communications Corp.**  
**4100 Los Angeles Avenue**  
**Simi Valley, CA 93063-9949**





## Workgroup Computing

**Galacticomm, Inc.** has announced Worldgroup, interactive on-line software.

According to the Fort Lauderdale, Fla., company, Worldgroup includes electronic mail, group message forums, file libraries, multiuser teleconferences, polls and questionnaires. The client can access the server through a modem or via the Internet.

The server software can handle more than 100 dial-up callers and up to 64 Internet connections. A multithreaded, error-correcting protocol gives users multitasking capabilities.

Prices range from \$400 to \$500.

► **Galacticomm**  
(305) 583-5990

**ImageFast Software Systems, Inc.** has announced ImageFast 3.0, document and image management software.

According to the McLean, Va., company, ImageFast 3.0 works with any standard Open Database Connectivity (ODBC) SQL database running any back-end PC, midrange or mainframe server.

Features include improved indexing, enhanced scanner support and an integrated workflow component to route information to network users.

A stand-alone version of ImageFast 3.0 includes Watcom International's ODBC SQL database and costs \$995. Prices for five concurrent users start at \$4,995.

► **ImageFast Software Systems**  
(703) 893-1934

**Caere Corp.** has announced PageKeeper 2.0, document management software.

According to the Los Gatos, Calif., company, PageKeeper 2.0 features automatic indexing and graphically displayed ad hoc queries ranked in order of importance.

A similar document search feature lets users employ one document to search for related documents, and a PK-Direct feature makes PageKeeper functionality available from other Windows applications. The product is integrated with Delrina Corp.'s WinFax Pro 4.0 to directly import faxes or receive logs.

PageKeeper 2.0 costs \$195.

► **Caere**  
(415) 395-7000

**Computer Systems Advisors, Inc.** has announced Silverrun-Enterprise, business modeling software that provides concurrent access for modeling teams.

According to the Woodcliff Lake, N.J., firm, Silverrun-Enterprise lets users build and manage a portfolio of models, including business process, conceptual, logical and physical data models as well as the model of a data warehouse.

Objects changed by one developer will be refreshed on the screens of others viewing the same objects.

Silverrun-Enterprise comes as part of Silverrun's Relational Data Module, which costs \$4,000 per user.

► **Computer Systems Advisors**  
(201) 391-6500

**UES, Inc.** has announced KI Shell 1.2, cross-platform workflow management software.

According to the Dublin, Ohio, firm, KI Shell 1.2 adds support for Windows and lets users participate with a consistent user interface in workflows that operate across PCs running Windows and OS/2 as well as workstations running IBM's AIX, Sun Microsystems, Inc.'s Solaris, Hewlett-Packard Co.'s HP/UX and Silicon Graphics, Inc.'s Irix.

KI Shell 1.2 costs \$1,200 for a runtime license, depending on the number of concurrent users.

► **UES**  
(513) 426-6900

**Tenon Intersystems** has announced Mach X 3.1, X Window System server software for Macintoshes.

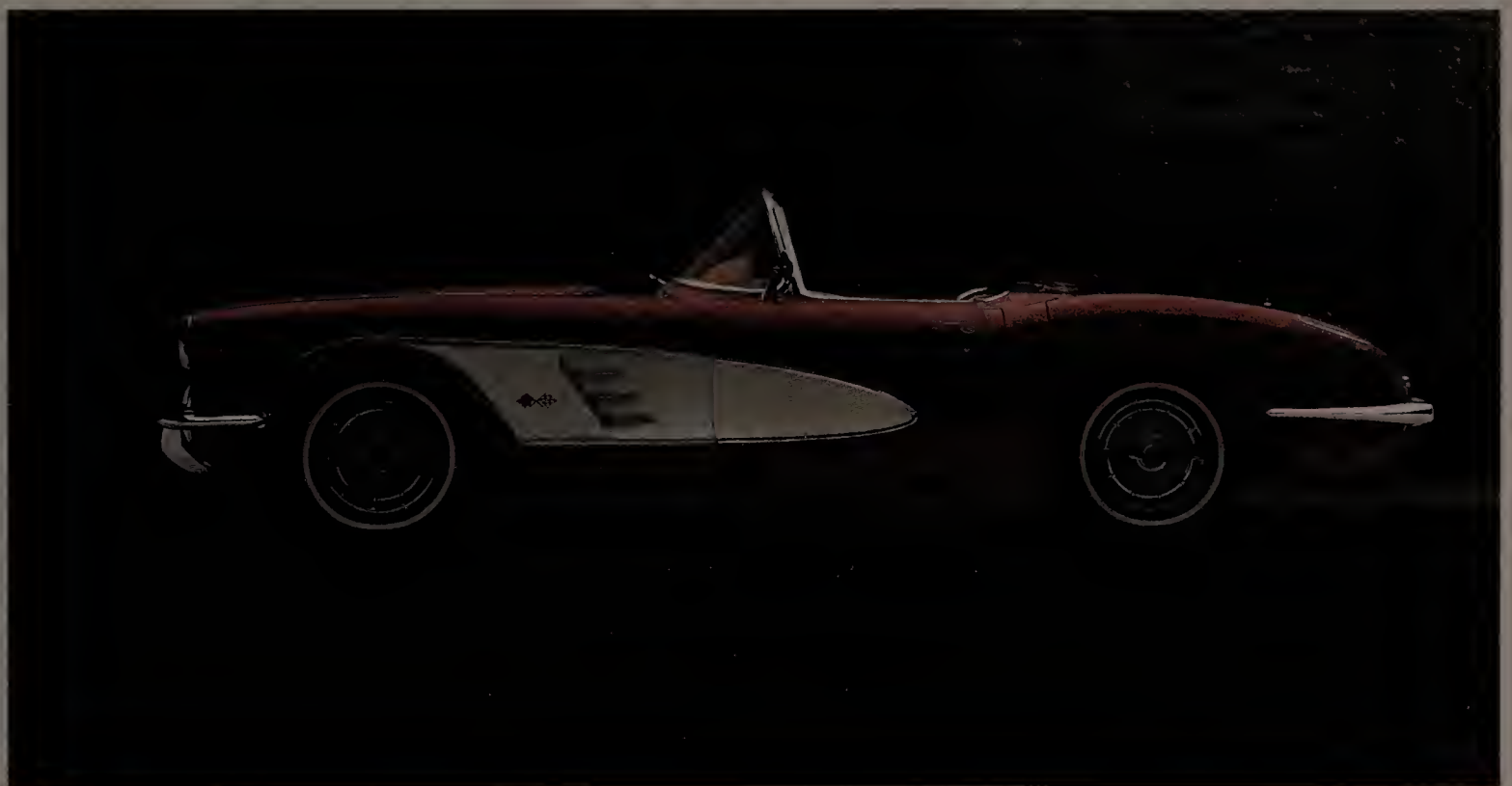
According to the Santa Barbara, Calif., firm, Mach X 3.1 supports 8-bit pseudo-color and lets users hide the Macintosh

top-level menu bar. The software comes with a TCP/IP protocol stack, Internet tools, serial communications support and Network File System file sharing.

It includes Xlib extensions for device-independent color, an X Display Manager, an executable font server, a set of X development libraries, a Motif tool kit and a suite of X clients.

Mach X 3.1 costs \$350.

► **Tenon Intersystems**  
(805) 963-6983



## "Marathon buys one of these every month"

"We were skeptical about the savings. Even after we saw a live demonstration, we didn't think Marathon could save our classic Corvette dealership all that much money. But we figured we'd save at least enough to pay for the equipment and then keep

some savings each month. So we installed a MICOM Marathon Data/Voice Network Server in our Saugus Massachusetts showroom and another in our new Pompano Beach, Florida facility.

Marathon let us route incoming calls between our locations for free.

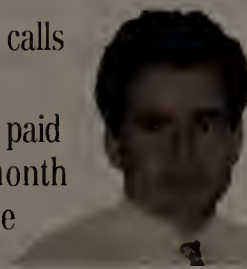
In just the first month, the savings paid for both Marathons. And every month since, Marathon has saved us the equivalent of a '58 Vette.

I'm Tony Visone of Visone Motors. I sell investments you can use and enjoy. And while a Marathon can't give you the same thrill as a vintage Corvette in your garage, it's an investment that can bring a smile to your face every month. "

Whether you have two or 250 locations, Marathon delivers all communications on one line. Ask for a free brochure today.

Call toll-free for the certified Marathon Distributor in your area (800) MICOM AD [642-6623] ext. 1034 or (805) 583-8600. 24-hour fax (805) 583-1997.

"The sooner you call, the sooner you can start investing in something you really want, instead of phone company toll charges. "



**MICOM**  
Products that pay for themselves.™

Trademarks are property of their respective owners.



# Upgrade today to the only network operating system better than NetWare 3: NetWare 4.1.

**T**he network. Your business depends on it. You keep it running. It's your baby. Well, what you're about to read will redefine networking. You'll see how the services in NetWare 4.1 define what a next generation network should be, and why it's so important that you upgrade today. The facts are right here in black and white. Please take ten minutes to read this ad. After all, isn't your business worth ten minutes of your time?

---

**NetWare Directory Services.**  
Access and view your entire  
network at a single glance.

---

The previous generation of networks only let you view the network one server at a time. They weren't exactly convenient. But with NetWare 4.1, it's different. You get a complete view of the network. It's the only network that allows users to login once and access any file, document or resource for which

they're authorized. Even better, administrators can manage the network from a single-point-of-administration. That means you avoid the hassle of managing your network server by server, managing it instead as a single entity.

Conveniences like these can save you a whole lot of time and money.

---

**NetWare Messaging Services.**  
The simplest way to manage  
your E:mail users.

---

In the past, messaging required a separate purchase, a separate installation, and a separate database. With NetWare 4.1, everything is a lot simpler. That's because integrated messaging built into NetWare 4.1 works with almost any E:mail front-end application. There's no additional mail software needed. And, it's integrated with NetWare Directory Services, so network and E:mail administration can be accomplished through a single-point-of-administration. It's a lot simpler, and a lot easier.

---

**NetWare Multiprotocol Routing.**  
Get your data from point A to point B.

---

Getting connected to other networks usually means buying separate hardware. But with NetWare 4.1, multiprotocol routing comes built-in. And because NetWare's Multiprotocol Routing supports IPX, TCP/IP, Appletalk and others, it connects networks without the need for additional hardware. And not buying all that extra hardware can add up to big savings. Who could possibly be against big savings?

---

**NetWare Network Management.**  
Easily the most manageable network.

---

NetWare 4.1 offers unmatched management and administration capabilities. For example, it allows you to take full control of any server from anywhere on the network. It also has a new graphical user interface that lets you manage the



network as a single entity, instead of a collection of separate servers. So jobs that used to take hours can be accomplished in minutes. Plus, tasks like setting up users, granting security privileges and access to resources—tasks that were very time consuming with NetWare 3—aren't with NetWare 4.1. Click a few icons, then type information in a dialog box. You've just added another user to the entire network. It's quick and easy. Again—saving you time and money.

### NetWare 4.1 Security Services. Simply the industry's most secure NOS.

One of the greatest concerns about any network operating system is how secure it is. NetWare 4.1 includes RSA security, the industry's most secure password encryption and digital packet signature technology. In fact, it was designed to meet the National Computer Security Center's Class C2 Network Security criteria. Look. If you can't afford to have confidential data in the wrong hands, that's reason enough to upgrade your network to NetWare 4.1 today.

### NetWare 4.1 File Services. We just improved on perfection.

NetWare 4.1 shares the same industry leading file system as NetWare 3, except it also comes with terrific, industry leading enhancements. There's a server-based file compression feature that can double the size of the hard drive, leaving more room for data. And sub-allocation provides more efficient storage. It also provides optional large block sizes which speeds data transfer performance from hard drive to memory. And data migration reduces storage media costs by transparently migrating data to near-line or off-line storage. You know, this is a great way to avoid having to shell out the big bucks for more space later.

### NetWare 4.1 Print Services just got smarter.

With NetWare 4.1, you can say goodbye to printing nightmares for good. NetWare 4.1 provides the most robust set of print services in the industry. It's terrific. For example, you don't need to know anything about the print server.

NetWare 4.1 has the lowest cost of ownership in the industry. In fact, the META Group reports NetWare 4.1 can cut 25%<sup>†</sup> from the cost of managing a network. Think of it. That means your NetWare 4.1 upgrade or new purchase will virtually pay for itself in no time. Here's a chance to make the accountants smile for once.

### NetWare 4.1. All this and much, much more.

NetWare 4.1 also comes with everything you need to run your network on TCP/IP, so you can run IPX or TCP/IP throughout your network. It also has built-in support for your Macintosh users. And built-in System Fault Tolerance level III capabilities. (To activate this service, all you have to do is simply purchase a license disk and you can reduce the chances of network failure to almost zero. And because it's built-in, there's no need to reload your system).

Still, we know all these features wouldn't mean diddly if they didn't work right out of the box. So we submitted NetWare 4.1 to rigorous testing—first we tested it at Novell labs, then the press took a crack at it, and finally, our toughest customers got their chance. It passed with flying colors. Without a doubt, NetWare 4.1 is set to take center stage in the industry.

We hope we've told you enough to get things underway. But in case you need more information about NetWare 4.1, just call Novell at

1-800-844-6661 or dial us in at <http://www.netware.com>. We'll do everything we can to help.

 **NOVELL**

7 Key Services	NetWare 4.1	NetWare 3
<b>1 DIRECTORY</b> Global directory service	YES	NO
<b>2 INTEGRATED MESSAGING</b>	YES	NO
<b>3 MULTIPROTOCOL ROUTING</b>	YES	Add-on product
<b>4 NETWORK MANAGEMENT</b> Graphical user tools provide view of entire network	YES	NO
<b>5 NETWORK SECURITY</b> RSA public/private key Restrict login to specific Mac address Security auditing	YES YES YES	NO NO NO
<b>6 FILE SYSTEM AND STORAGE</b> Support for data-migration hardware, data compression and disk block suballocation	YES	NO
<b>7 NETWORK PRINTING</b>	256 per print server	16 per print server
<b>Additional Services</b>		
● <b>INTEGRATED SYSTEM FAULT TOLERANCE LEVEL III</b>	YES*	Add-on product
● <b>CLIENT SUPPORT AND INTEROPERABILITY</b> NetWare for Macintosh, Number of user licenses included  Graphical user tools	Included in Netware user licenses  YES	5  NO
● <b>WAN SUPPORT</b> Network link Service Protocol™ (NLSP)™	YES	Add-on product
● <b>ARCHITECTURE</b> Maximum number of user connections per server Nondedicated server Single login to network Additive licensing	1,000 YES** YES YES	250 NO NO NO

All you need to know is the name of the printer and you're set. That's it. Plus, NetWare 4.1 Print Services maximizes your hardware investment because it allows up to 256 printers to run off one server (as opposed to NetWare 3, which limits you to 16 printers). Just think how much time, money, and hours of frustration this could save you.

### NetWare Return on Investment. It makes sense on your bottom line.

**NetWare 4.1**

The only network  
ready for tomorrow, today.



AST

# INTRODUCING MANHATTAN. THE BIGGEST THING SINCE MANHATTAN.

If MANHATTAN IS ONE OF THE WORLD'S leading business centers, then our new line of servers is aptly named.

Because there isn't a company around that wouldn't benefit from having an AST Manhattan™ server at its center.

Manhattan servers are quite simply the most advanced you can buy. Recently voted "Best of Show" by LAN Times/ Data Communications at Networld+Interop, they include almost every feature found on competitive servers, and then some.

Essential technologies like disk array's, fault tolerance, network management tools, ECC memory, Pentium™ pro



cessors, PCI local bus and environmental monitoring are only the start. For once, "state-of-the-art" is no idle cliché.

In addition, Manhattan servers are totally compatible with your network.

To make sure of it, AST has formed strategic alliances with companies like Microsoft, Intel, IBM and Novell. The fact is, our Manhattan servers were used as a development platform for Windows NT,™ OS/2\* and Netware.\*

Now, if you've ever had any concerns about server reliability, let us set your mind at ease. *PC World*\* rated AST among the top manufacturers for reliability and service. We offer AST customers around-the-clock phone support, a 3-year on-site warranty\*\* and a selection of extremely responsive service programs.

You can call us at 800-876-4AST for more information. Better yet, we'll give you the name of the reseller near you who's ready and waiting to put together your ultimate server solution.

Because, from now on, there will only be two kinds of servers. AST Manhattan servers. And second best.

**Manhattan P Series**  
The pinnacle of LAN power. Intel 90MHz or 100MHz Pentium processors, dual processor capable, PCI/EISA bus, hot-swappable disks and ECC memory.

**Manhattan V Series**  
The affordable high-performance LAN server. Intel 90MHz Pentium processor, dual processor capable, PCI/EISA bus, environmental monitoring and server management tools.

**Manhattan G Series**  
The power-driven workgroup server. Intel 60MHz Pentium processors, PCI bus and server management tools.

**Manhattan SMP**  
The ultimate enterprise server. Up to 5 Intel Pentium processors, extensive fault-tolerant features, EISA bus, disk array standard, 16 hot-swap drive bays and ECC memory.

**Manhattan HighRise**  
The scalable solution for managing your resources. Rack-mount up to 4 P or V series servers for the ultimate in convenience and ease-of-use.

**YOU'LL LIKE THE WAY WE WORK™**

**AST**  
COMPUTER

© 1994 AST Research, Inc. All rights reserved. AST is a registered trademark of AST Research, Inc. AST Computer, the AST logo, Manhattan and You'll Like the Way We Work are trademarks of AST Research, Inc. Intel and Intel Inside are registered trademarks of Intel Corporation. OS/2 is a registered trademark of International Business Machines Corporation. Netware is a registered trademark of Novell, Inc. Windows NT is a registered trademark of Microsoft Corporation. All other product names, trademarks and service marks mentioned herein may be trademarks or registered trademarks of their respective owners. Configurations and specifications may vary and are subject to change without notice. \*June 1994. \*\*Warranty service in over 30 countries outside the U.S. For a complete listing of the nearest AST authorized service provider, call AST for warranty details.



## Verdict not in on Time Warner's trial interactive cable system

By Ellis Booker and Kim S. Nash

Time Warner Cable's Full Service Network (FSN) trial — one of the first attempts at interactivity over a cable system — has received equal amounts of praise and derision.

Officially launched on Dec. 14, 1994, the network will connect 4,000 customers in Orlando, Fla., by year's end.

The pilot system, which will run for about one year, has won kudos for its use of the latest digital switching, digital compression and digital transmission technologies.

AT&T Network Systems is supplying the Asynchronous Transfer Mode switching gear; Silicon Graphics, Inc. is providing the media server platform and operating system; and Scientific-Atlanta, Inc. is supplying the set-top box, which connects a subscriber's television to the network, as well as the network electronics and fiber-optic cable.

Fully configured, FSN will offer 1 GHz of bandwidth before compression. Fiber-optic lines from the head end will connect to neighborhood nodes; about 500 homes will be connected to each node over coaxial cable.

### Size an issue

Some observers have lambasted the small size of the FSN test, which was inaugurated with just a handful of residences and still only involves about 20 homes and another 30 sites at FSN offices or at the homes of FSN employees.

"All these [interactive TV] trials end up proving if you create a scenario that's commercially impossible but give it away, people will take it," said Tom L. Nolle, president of CIMI Corp., a market research firm in Voorhees, N.J.

None of the video-on-demand trials have been able to cost-justify their expected infrastructure investments, he said. "People would have to spend \$5 per movie, five days a week," Nolle said.

Other critics point to the eight-month delay in the FSN's start date, which was supposed to have been April 1994.

"We'll have 4,000 homes by the end of the year," said Mike Luftman, vice president of corporate communications at Time Warner Cable in Stamford, Conn. Luftman said a delay of a few months is not unusual for high-technology companies, and Time Warner was surprised by the "almost hostile" criticism it received when it missed its April start date.

### Two possibilities

According to Luftman, some of the ire reflects the ongoing debate over whether the information superhighway will be accessed by televisions or PCs. "Some services make more sense [to deliver] over a TV, some over a PC," he said. "To us, it is blatantly clear it is both."

In fact, Time Warner is covering its bets: Later this year it will announce a trial for PC-based on-line services across one of its cable networks, and earlier this year, it announced an Internet-based version of its anemic Catalog 1 cable shopping channel joint venture with Spiegel, Inc. A month ago, Time Warner scaled the cable version of Catalog 1 back from round-the-clock operation to running just on Saturday mornings.

Those involved in the FSN test say Time Warner will derive important metrics about what consumers want from interactive TV.

"They're looking at what people want to do, how much people are willing to pay, and what the killer application[s] will be," said Qung Go, the Andersen Consulting technology integration services partner who oversaw the project. Chicago-based Andersen assisted Time Warner with program management, network engineering, integration testing and deployment of the network.

However, Nolle disagreed. "Exploratory" interactive cable trials such as FSN are valuable from a technical standpoint, he said, but "you can't use them to test what can be expected in the broad market."

But Go, noting that every major phone company and cable company is performing some kind of interactive cable experiment at the moment, said user companies should prepare for how these future systems will impact the way they communicate with customers and provide services.



## Deere conquers bandwidth crunch demon

By Laura DiDio

Bandwidth, or the lack of it, is a problem that is becoming commonplace as businesses strain the limits of their networks to maximum capacity and beyond.

In the case of John Deere & Co.'s Waterloo Works manufacturing plants in Waterloo, Iowa, running out of bandwidth was not just a one-shot deal. It was a recurring situation that cropped up every two years, according to Ron Stahlhut, a senior engineer at John Deere.

The company finally conquered the bandwidth demon by swapping out its point-to-point Ethernet wide-area network bridges and installing three Digital Equipment Corp. 14-slot GIGAswitch/FDDI devices. These, Stahlhut said, will provide John Deere with enough capacity to meet its bandwidth needs "beyond the year 2000."

### Upgrading regularly

"We were a textbook example of a shop that was maxing out its bandwidth on a regular basis as we installed more and more demand-intensive engineering applications on our networks," Stahlhut said. "Every two years like clockwork, we'd spend at least \$60,000 to upgrade our WAN links."

The company has a diverse network setup that includes Unix, Macintosh and DOS machines running a combination of Novell, Inc.'s NetWare 3.11, Microsoft Corp.'s Windows NT Server 3.5 networks as well

## ON SITE

### John Deere & Co.'s Waterloo Works

Waterloo, Iowa

**Problem:** Plants were running out of network capacity every two years.

**Technology:** Three Digital 14-slot GIGAswitch/FDDI devices.

**Results:** Plenty of extra capacity, including the ability to take down one of the data links for maintenance and still have leftover bandwidth.

## This free booklet helps you make the right connections.

Linking remote UNIX systems to IBM hosts can be a challenge. There are many issues to consider:

- Do you have a traditional SNA/SDLC network, or do you use TCP/IP, APPN, or X.25 as your network backbone? Do you need Token-Ring support?
- Are your UNIX systems linked to LANs? Are you moving to client/server?
- Do you access 3270/5250 applications interactively, use batch (RJE), or do both?
- Do you need programming interfaces such

as HLLAPI, APPC/CPI-C/LU6.2, and LU6.3?

➤ How do you manage your network? How do you distribute programs and files to your remote UNIX systems?

➤ Do you need to automate your file transfer applications, as in nightly polling of remote sites?

CLEO can help you sort it all out. Our UNIX-to-IBM Connectivity Solutions Guide clearly and concisely explains your alternatives. Easy-to-understand configuration diagrams help you match the right solutions to your needs.

To order your free copy, call  
1-800-233-2536 (fax: 313/662-1965).  
Or write to us at 3796 Plaza Drive,  
Ann Arbor, MI 48108.

**CLEO**  
CLEO Communications  
A Division of Interface Systems, Inc.

Available worldwide! In Europe, call  
Interface Systems International in Slough,  
England, at +44-0753-811888 (fax: +44-0753-811666).





# COMPUTERWORLD CLIENT/SERVER JOURNAL

Where distributed computing meets business objectives

## On June 15, Meet the 25 Top Users of Client/Server Technology

in a special edition of Computerworld Client/Server Journal



### The Magazine

Client/Server. Where's it at in the real world? You'll find out in a special June 15 edition of Computerworld Client/Server Journal. With the expertise of Cambridge Technology Partners, a world renowned client/server consultancy, we surveyed more than 250 North American organizations to gauge their client/server prowess. Our special issue will list the 25 top most effective users of client/server technology by measuring their:

- Investment in infrastructure.
- Application architecture and deployment.
- Applications' hard and soft benefits.
- Technology/business strategy alignment.
- IT management philosophy and culture.

### The Event

On June 15, at DCI's **Database & Client/Server World** in Boston, you're invited to a panel discussion at 9:30 that includes the Top Three companies, the survey judges and moderator Alan Alper, editor of Computerworld Client/Server Journal. Hear firsthand what went into selecting the Top 25 and how these organizations made client/server work for them.

For more information on this panel, call (508) 470-3880.

Magazine Sponsor



Research Partners

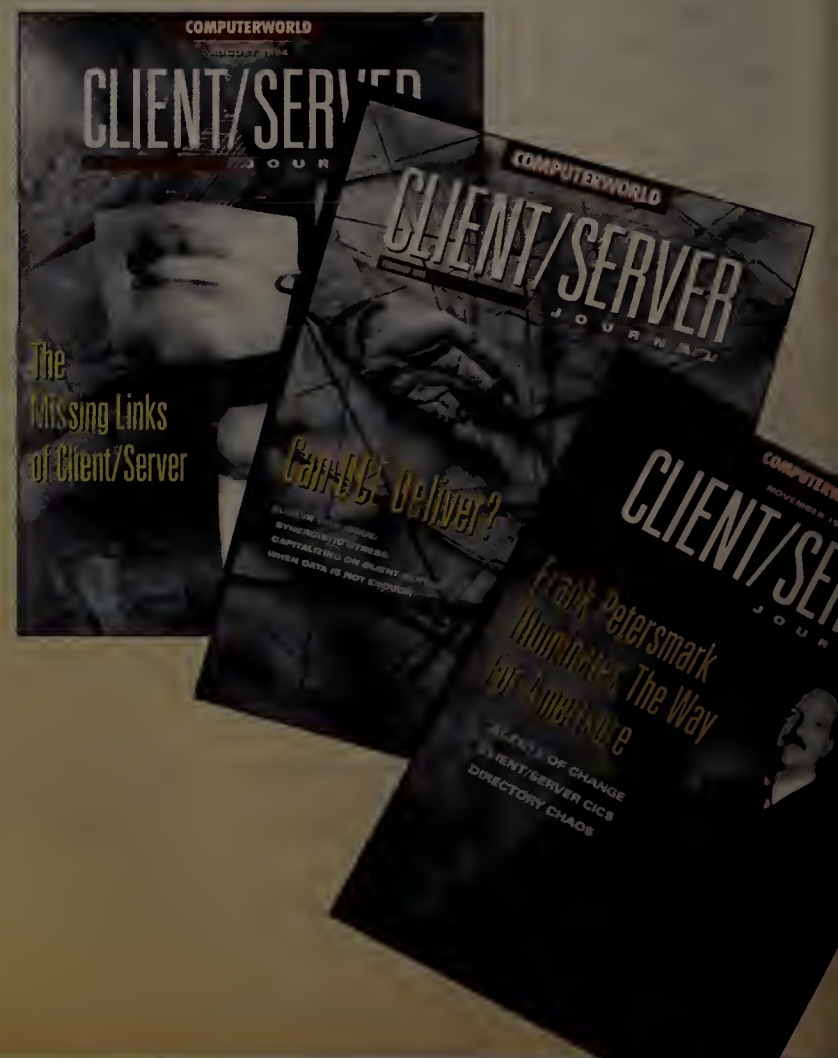


Event Sponsor



COMPUTERWORLD  
CLIENT/SERVER  
JOURNAL

Where distributed computing meets business objectives





# Take a slice off the price of COMPUTERWORLD.

51 issues for only ~~\$48~~. *Now Only \$39.95*

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$39.95\* per year - a savings of \$8.00 off the basic subscription price. Plus, I'll also receive the '94-'95 COMPUTERWORLD Salary Survey FREE just for trying COMPUTERWORLD. P/Code 98

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_

Title \_\_\_\_\_ Company \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48

\* U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

- 10. Manufacturer (other than computer)
- 20. Finance/Insurance/Real Estate
- 30. Medical/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Dist./Retailer
- 95. Other \_\_\_\_\_

(Please Specify)

2. TITLE/FUNCTION (Circle one)

- IS/MIS/DP MANAGEMENT
- 19. Chief Information Officer/Vice President/ Asst. VP
- IS/MIS/DP Management
- 21. Dir./Mgr. MIS Services, Information Center
- 22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin. Services
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Management
- 60. Sys. Integrators/VARs/Consulting Management
- CORPORATE MANAGEMENT
- 11. President, Owner/Partner, General Manager
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

- 51. Sales & Mktg. Management
- 70. Medical, Legal, Accounting Management
- OTHER PROFESSIONAL MANAGEMENT
- 80. Information Centers/Libraries, Educators, Journalists, Students
- 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems

- (a) Solaris (e) Mac OS
- (b) Netware (f) Windows NT
- (c) OS/2 (g) Windows
- (d) Unix (h) NeXTstep

App. Development Products

☐ Yes

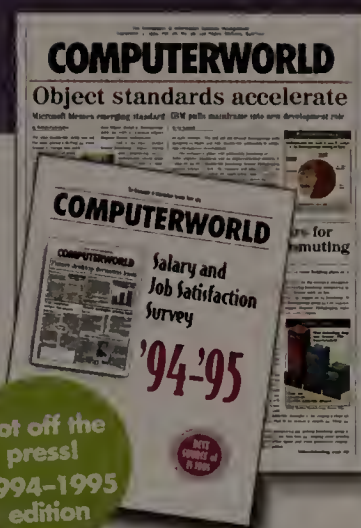
☐ No

Networking Products

☐ Yes

☐ No

E4C5-6



# Take a slice off the price of COMPUTERWORLD.

51 issues for only ~~\$48~~. *Now Only \$39.95*

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$39.95\* per year - a savings of \$8.00 off the basic subscription price. Plus, I'll also receive the '94-'95 COMPUTERWORLD Salary Survey FREE just for trying COMPUTERWORLD. P/Code 98

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_

Title \_\_\_\_\_ Company \_\_\_\_\_

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48

\* U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

- 10. Manufacturer (other than computer)
- 20. Finance/Insurance/Real Estate
- 30. Medical/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Dist./Retailer
- 95. Other \_\_\_\_\_

(Please Specify)

2. TITLE/FUNCTION (Circle one)

- IS/MIS/DP MANAGEMENT
- 19. Chief Information Officer/Vice President/ Asst. VP
- IS/MIS/DP Management
- 21. Dir./Mgr. MIS Services, Information Center
- 22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin. Services
- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Management
- 60. Sys. Integrators/VARs/Consulting Management
- CORPORATE MANAGEMENT
- 11. President, Owner/Partner, General Manager
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

- 51. Sales & Mktg. Management
- 70. Medical, Legal, Accounting Management
- OTHER PROFESSIONAL MANAGEMENT
- 80. Information Centers/Libraries, Educators, Journalists, Students
- 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems

- (a) Solaris (e) Mac OS
- (b) Netware (f) Windows NT
- (c) OS/2 (g) Windows
- (d) Unix (h) NeXTstep

App. Development Products

☐ Yes

☐ No

Networking Products

☐ Yes

☐ No

E4C5-6







NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P O BOX 2044  
MARION OHIO 43306-4144



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P O BOX 2044  
MARION OHIO 43306-4144





# HP, Legent broaden management platforms

By Steve Moore

In separate but related moves, Hewlett-Packard Co. and Legent Corp. recently sought to expand the scope of their network and systems management products by broadening their relationships with other players.

Both vendors are leveraging their industry ties to redefine themselves as purveyors of enterprisewide management suites. Under its OpenView Solution Framework, HP will make its application programming interfaces (API) available to developers who want to integrate their applications with key OpenView components, beginning now with the OperationsCenter problem management software.

For its part, Legent will integrate Simware, Inc.'s RexxWare LAN administration tool and IX Corp.'s Open Rexx scripting language into its Prevail/XP products to support automated management of Novell, Inc.'s NetWare servers. In March, Legent will also ship Prevail/XP Automation Point for HP/UX, which will incorporate HP's OperationsCenter.

Given the announcements, HP claims it will deliver comprehensive network, systems, application and database management via its Common OpenView Solution Framework. Legent promises to automate the management of all devices,

networks and servers in mainframe, Unix and NetWare shops.

But users doubt whether any single vendor can orchestrate a total information technology solution. There is nothing on the market "that can be truly considered an enterprise management server," said Frank Belland, a senior communications consultant at Martin Marietta Corp. in Orlando, Fla.

"If you have four operators going into a server for router and hub management, systems management, E-mail management and database management, putting all that in one box buries the box" by overwhelming the server's ability to handle the workload, he said.

## Integration benefit

The main advantage of integration is not necessarily having one box that handles every management function. Instead, the major benefit is in "leveraging your staff by receiving alerts for problems that exist in systems, networks or applications and passing them on to the appropriate level of support for resolution," said Paul Edmunds, a senior information systems analyst at Duke Power Co. in Charlotte, N.C.

In other words, automated alerts can get to a single console operator who will forward them to the appropriate person. This replaces a system where staffers

are constantly running around checking on things and trying to decide whom to notify.

Users also questioned the wisdom of funneling too many management functions to a single administrator. If called upon "to manage a total enterprise from one high-end workstation, one human would go into sensory overload," Belland said. Rules-based artificial intelligence technology may ease the man/machine

thinkable systems integration challenge," said Barbara Sannerud, systems software technology research director at Gartner Group, Inc. in Stamford, Conn.

However, she added, because every platform vendor wants relationships with the top software vendors, the key differentiator for the platform suppliers is the "infrastructure to leverage the applications." By that she meant all the things it takes to make applications "snap in" to a platform, including APIs, a common data repository and common user interface.

## NetWare issues

Once vendors give customers the means to integrate information technology management, users then must deal with real-world organizational issues.

"It remains to be seen whether organizations really want to manage NetWare servers from the same point as Unix servers," said

Paul Mason, research manager for enterprise systems management at International Data Corp. in Framingham, Mass. But, he added, referring to Legent's effort to integrate Unix and NetWare automation capabilities, "people who installed NetWare servers did it for a reason — to get away from central IS."

## Network management news

### Hewlett-Packard

OpenView OperationsCenter services and APIs available to developers now; OpenView AdminCenter services and APIs to be available to developers in early 1996.

### Legent

Will ship Prevail/XP Automation Point for HP/UX in March and support Novell NetWare LAN management by integrating technologies from Simware and IX Corp. into the Prevail/XP product suite.

interface bottleneck in the future, he added.

Increasing cooperation among platform vendors and independent software vendors will simplify procurement by enabling users to buy integrated application suites. Traditionally, users have had to buy "20 different products from 20 different vendors — ending up with an un-

# Wildfire sparks interest in phone software

By Michael Fitzgerald

Wildfire Assistant, a product designed to help heavy-duty travelers keep their work lives from flaring out of control, recently began shipping.

Wildfire Assistant, from Lexington, Mass., start-up Wildfire Communications, Inc., combines hardware and software to help track and sort calls for users. For example, the product lets a person at a pay phone take incoming calls.

The market may have given Wildfire Assistant a spark because three companies have purchased units. In addition, eight companies bought pilot capabilities.

Companies that purchased the first Wildfire units include McCaw Cellular Communications, Inc., which bought a 72-user system; Natural Microsystems, Inc., which bought a 24-user system; and Swiss Bank Corp., which bought a 48-user system.

## Cellular opportunities

McCaw also invested \$5 million in Wildfire and is considering using the company's technology to enhance its cellular service. The investment is not exclusive, and Wildfire is talking to other phone companies about ways to build its services into their systems.

Nicholas D'Arbeloff, Wildfire co-founder and vice president of marketing, said the McCaw investment "is

a huge step" for Wildfire because it may open up new markets for the Wildfire Assistant. For instance, small companies typically cannot afford to purchase Wildfire Assistant. However, giving them the option to buy Wildfire Assistant's capabilities from a phone carrier could tap a significant market for the company.

D'Arbeloff also said none of Wildfire Assistant's beta sites have dropped the product, and the company is "very close" to selling systems to several of those companies.

One beta tester that purchased the pilot software is Temps & Co. in Washington, a temporary personnel agency.

Jason Feldman, a subcontractor at Temps & Co. who runs its Wildfire project, said the company is seriously considering applying the product to several aspects of the business. He said Temps & Co. is examining Wildfire Assistant's voice recognition.

Feldman said the company believes it can use voice recognition as a competitive advantage over other temporary agencies, particularly in conjunction with internal databases. He declined to specify in what ways.

Wildfire is now focusing on building relationships with other carriers and developing a sales channel, D'Arbeloff said. The company is also plunging ahead to develop a version of its software that will run over networks.

Previously, Wildfire officials had said the company

## Wild talk

### Wildfire components include:

#### Operating system

Sits on top of the server operating system and serves as communications hub and platform manager.

#### Object database

Is integrated with the operating system, interface and assistants. It accepts verbal or data input and creates a contact database. With agents, it can automatically dial numbers when a name is spoken.

#### Multimedia user interface

Sits between the operating system and the assistants and agents. With it, Wildfire can answer a user's phone with a personalized message.

#### Assistants and agents

Handles message delivery and other tasks. They are user-defined.

## Briefs

### FCC moves ahead with PCS

The Federal Communications Commission has moved to Stage III of its auctions for personal communications services. Stage III accelerates the auctions by requiring bidders to place bids based on their total eligibility for licenses. Total bids on the 99 licenses exceeded \$6 billion for the first time last month.

### VTAM for VM, VSE nearly ready

IBM has announced that VTAM 4.2 will be available for VM/ESA and VSE/ESA by mid-March. VTAM 4.2 will offer Advanced Peer-to-Peer Networking capabilities for the VM and VSE environments. These include the ability for VM and VSE SNA hosts to participate as peers and servers in an SNA network.

### MCI signs \$375M pact

MCI Communications Corp. has signed a \$375 million agreement with Retex, a national consortium of retail stores. MCI is also developing electronic data interchange and videoconferencing applications for the virtual private network.



## Routing

# Cisco, 3Com aim to ease internetwork routing

By Stephen P. Klett Jr.

Cisco Systems, Inc. and 3Com Corp. recently announced additions to their respective software platforms that are aimed at simplifying routing in large internetworks.

3Com in Santa Clara, Calif., has introduced the following four capabilities designed to make it easier for users to deploy large IBM-based internetworks:

- **Smart filters:** Minimize unnecessary wide-area network traffic by reducing the heavy broadcast traffic and session polling associated with SNA and NetBIOS data transmission.

- **Payload compression:** Maximizes bandwidth for SNA applications by compressing packet header size for transmission across wide-area links. For example, a 200-packet frame can be reduced to a 50-byte frame, 3Com said.

- **Automatic prioritization:** Allows SNA traffic to travel across wide-area links before other protocols, such as IP and IPX, without any handling by network administrators.

- **Local termination:** Terminates local SNA and NetBIOS traffic to reduce session disruptions in remote office environments.

"These additions give users the ability to tune their SNA handling capabilities to match the parameters of their applications more exactly, which will result in savings," said Tom Nolle, president of CIMI Corp. in Voorhees, N.J.

The additions are an extension to 3Com's Boundary Routing Architecture and will ship with the NetBuilder Remote Office product line.

Meanwhile, Cisco in San Jose, Calif., last week an-

nounced support for Novell, Inc. NetWare environments in its Internetwork Operating System software. Cisco routers will now support the following features:

- **Novell's NetWare Link Services Protocol (NLSP),** which was designed to improve scalability in WANs.

- **Novell's IPXWAN 2.0 protocol,** which was designed to improve the efficiency of NetWare servers working with Cisco routers.

- **IPX Floating Static Routes,** which were developed by Cisco to boost network fault tolerance.

Observers lauded the NLSP support for easing scalability problems associated with running the Routing Information Protocol (RIP) in Novell environments.

In a typical environment, RIP updates are broadcast every minute, which can place a serious bandwidth burden on growing networks. NLSP combines service and router information in the router's link-state database, and updates are broadcast every two hours instead.

"This gives Novell router-protocol credibility without having to dedicate a great deal of [research and development] to get it," Nolle said. He added that the improved routing capabilities were vital for Novell to sustain user support for its IPX protocol.

Robert Tharp, network architect at Stanford Health Services in Stanford, Calif., agreed.

"We'd rather see Novell go off IPX completely and support either [Open Shortest Path First or Interior Gateway Routing Protocol], which are both more mature from a routing perspective. But if our second choice is Novell coming up with a new routing methodology and Cisco supporting it — I'll certainly take that," Tharp said. "Anything that replaces RIP has to be good."



Enterprise Systems Management Corp. has announced UName-It, a client/server Unix application that allows multiple systems administrators to cooperatively manage an enterprise's shared name space.

According to the Tustin, Calif., firm, UName-It simplifies support of multiple name services such as the Internet's Domain Name System and Sun Microsystems, Inc.'s ONC+NIS by providing a consistent way to store user names and addresses in a shared central database.

UName-It costs \$24,000 for a basic license of about 400 network nodes and users. Pricing is based on the size of the name space managed and includes licenses for the database engine, the graphical and programmatic clients, the server and some additional scripts.

► *Enterprise Systems Management*  
(714) 573-4075

Interphase Corp. has announced the 5515 PCI ATM adapter card, a 155M bit/sec. card.

According to the Dallas firm, the 5515 PCI ATM adapter card is optimized for Peripheral Component Interconnect (PCI)-based servers and high-end desktops.

The product comes with drivers for Microsoft Corp.'s Windows NT and Novell, Inc.'s NetWare.

The 5515 PCI ATM adapter card costs \$650.

► *Interphase*  
(214) 919-9000

NetPro Computing, Inc. has announced DS Expert for NetWare 4.1, network utility software.

According to the Scottsdale, Ariz., firm, DS Expert for NetWare 4.1 monitors, troubleshoots and optimizes Novell, Inc.'s NetWare Directory Services.

Features include partition views, partition alerts, multiserver traces, replication error warnings, server time synchronization alerts and low disk space alerts.

DS Expert for NetWare 4.1 costs \$1,299 for two agents. Each additional agent costs \$499.

► *NetPro Computing*  
(602) 998-5008

## Waterloo Works

CONTINUED FROM PAGE 53

as TCP/IP, Apple Computer, Inc.'s AppleTalk and Digital's DECnet protocols.

The networks run a wide range of computer-aided design/manufacturing and geometric multimedia applications along with word processing, spreadsheet and electronic-mail applications.

The number of users at Waterloo Works plants has remained fairly constant in recent years. But network usage has grown dramatically for mundane file and print services as well as more and different kinds of data stored on the file servers. For example, Stahlhut said users have been clamoring for the geometric multimedia documents used in service manuals.

### Bandwidth shortage

The increasing demands of the Unix engineering applications and desktops constantly put them in a bandwidth crunch situation.

Waterloo Works inexorably outgrew its complement of 3Com Corp. and Fiber-mux Corp. WAN bridges as the size of

their links increased from T1 to traditional Ethernet to the current DS/3 leased-line 45M bit/sec. connections.

"When bandwidth got tight and response time on applications slowed, we experienced slow screen updates, and we'd occasionally lose connections," Stahlhut said. "We went looking for the three E's: easy expandability, cost-effectiveness and ease of use."

At the same time, Waterloo Works wanted to maintain a flat network structure, which meant minimizing the number of routers and implementing Ethernet switches wherever possible, Stahlhut said.

At a cost of \$35,000 each, the three Digital GIGAswitch/FDDI devices fit the bill. They provide Waterloo Works with ample bandwidth and are more cost-effective than installing high-speed routers at each location, Stahlhut said.

Each of the GIGAswitch/FDDI devices are equipped with 14 slots, 11 of which can be used for 100M bit/sec. Fiber Distributed Data Interface (FDDI) connec-

tions for an aggregate bandwidth of 1,100M bit/sec. They also deploy Asynchronous Transfer Mode cells over the 45M bit/sec. line connections using Digital's encapsulation method.

### A direct link

Such high performance has enabled John Deere to effectively maintain its flat network structure and simplify router configurations.

The Cisco Systems, Inc. 7000 series routers, 3Com 3GH hubs and all file network servers link directly to the GIGAswitch/FDDI devices.

The server links, for example, give the John Deere manufacturing facilities high-performance access to engineering and obviate the need to buy a separate server for each site, Stahlhut said.

"The performance [of the GIGAswitch/FDDI devices] has been excellent. We've been able to do network switches on the fly; we can take down one of the DS/3 data links and not even notice a traffic rerouting on the GIGAswitches.



### Agricultural equipment

As the world's leading producer of agricultural equipment, with sales of more than \$8 billion in 1994, John Deere and its subsidiaries manufacture and distribute a full range of goods in more than 160 countries worldwide. The company's Waterloo Works manufacturing facilities consist of three plants spanning 11 miles, encompassing more than 7 million sq. ft. of manufacturing space and housing 2,500 end users.

They've been running like clockwork," Stahlhut said.

Best of all, the GIGAswitch/FDDI devices offer easy scalability to full 155M bit/sec., OC/3 ATM and Synchronous Optical Network capabilities for a relatively low investment of about \$3,000 by simply changing a daughter card, Stahlhut said. The company plans to upgrade to ATM once the standard is set, he added.

"Overall, we're extremely pleased with the DEC GIGAswitch/FDDI, they do the job at a price we can live with. In less than a year, they've become such a key network component we couldn't operate today without them," Stahlhut said.



where you are

considering if

AT&T Paradyne

prices

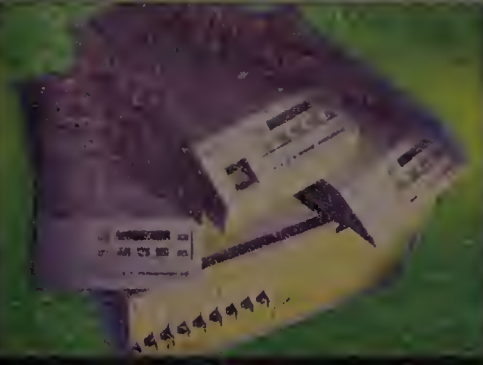
moderns

DSUs and such

products

advertise

them?



Access the Globe.

Our products do have good prices. And starting now, we're going to mention them every chance we get. However, we never want to forget to tell you what good values they are. Our CSU/DSUs for example. We manage to price them competitively without sacrificing their technical integrity. In fact, according to a recent IDC poll, they lead the industry in customer satisfaction. Across the board - from our 56K DSUs to our multiple T1/E1 access multiplexers for lease-line, frame relay and ISDN environments. What does all this mean? It means we understand that business requirements go hand-in-hand with budget requirements. It means that with AT&T Paradyne you can access the four corners of the globe without reaching too far into your pockets.

- ACCULINK® 3160 Series** - T1 CSU/DSU, DSX-1 drop and insert port, embedded SNMP agent, from \$2795.00
- COMSPHERE® 3615 Series** - Diagnostic router/frame relay DSU, from \$1795.00
- COMSPHERE 3610 Series** - Single port, multiple line-speed DSU, from \$1295.00
- COMSPHERE 3550 Series** - Multirate DSU, full remote network management capabilities, from \$895.00
- COMSPHERE 3510 Series** - Multirate DSU for applications not requiring centralized network management, from \$695.00
- ACCULINK Access Controller** - Integrated access multiplexer, from \$5900.00

Win a trip  
anywhere  
in the world.

Call 800 482-3333  
ext. 744 today. Get your 1995  
AT&T Paradyne Interactive  
Product Catalog\* play the exciting  
game "Access the Globe" and  
find out if you've won.

1995 AT&T COMSPHERE and ACCULINK are registered trademarks of AT&T. All other products or registered service marks of their respective owners. Prices shown are recommended list prices. No purchase necessary. Void where prohibited. Open only to U.S. residents of legal age, 18 years of age or older and are owners/users of personal computers, with the exception of AT&T employees or their families. Complete rules, by which all are bound, contained on response disk. Limit one response disk per person. Sweepstakes ends and prizes must be claimed by 7/31/95.





# AUTHO



PC MAGAZINE NETWORK EDITION, EDITOR'S CHOICE AWARD "[Windows] NT Server simply provided the best combination of features, usability, a set of full but easy to use management tools, and the simplest and most impressive installation routine of any NOS we've seen." —PC Magazine, December 20, 1994

1994 BYTE AWARD OF EXCELLENCE "The new version is slimmer than 3.1. It carries big loads for servers and serious business, scientific and engineering users. Its performance-monitoring and event-logging services are sophisticated."

—BYTE Magazine, January 1995



NSTL RECOMMENDED PRODUCT "Windows NT Server 3.5 has attained top rankings in all categories of NSTL's NOS evaluation. Windows NT Server's excellent performance, ease of use, and ease of learning features combined with its excellent networking make it a strong candidate for many network environments."

—Software Digest Ratings Report, November 1994

ANALYST'S CHOICE AWARD "Windows NT [Server], in particular went the additional mile to fit into as many environments as possible. This makes Version 3.5 an excellent choice for an applications server, integrating smoothly into NetWare and LAN Server networks."

—PC Week, November 14, 1994

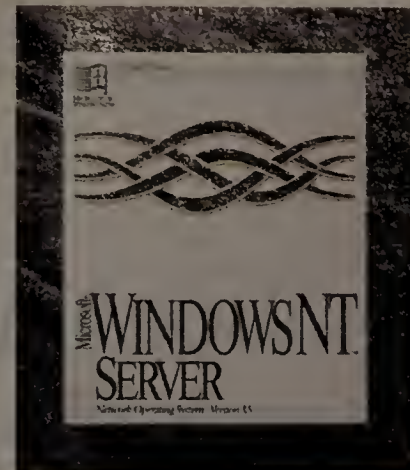


EDITOR'S CHOICE AWARD "As for the competition, NT 3.5 is certainly a worthy rival to NetWare and Vines as a network operating system platform and with Unix as a premier application server platform."

—Network Computing, December 1, 1994



# RITY.



IN A DECISION, IT GIVES YOU SOMETHING  
REAL TO GO ON. AND WITH A CHOICE AS  
CRITICAL AS UPGRADING YOUR NETWORK,  
IT BEATS THE DAYLIGHTS OUT OF  
“ONE POTATO, TWO POTATO.....”

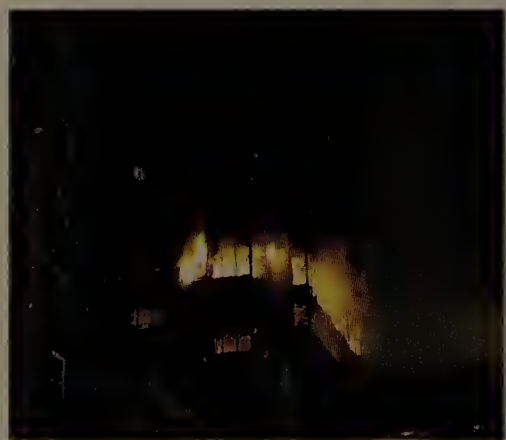
Authority is tough to argue with. Especially when the authorities are all saying the same thing—that Microsoft® Windows NT™ Server operating system is the best overall choice, as it is both a powerful application server and extremely fast file and print server. That's right, with Windows NT Server, superior file and print capabilities are just the beginning, not the end of the road. And because it is such a powerful multi-purpose server, Windows NT Server is the best foundation for a new generation of business solutions. But rather than us telling you to decide on Windows NT Server, see why the premier industry authorities (experts who have tested it, evaluated it and re-evaluated it against the competition) have recommended Windows NT Server without hesitation. Call us at (800) 709-3784, Dept. HHG and we'll send you these reviews in their entirety as well as information about Microsoft Solution Server, a structured trial program. Or, if you can't wait to start your own evaluation, visit a reseller today. Either way, it's your decision.

**Microsoft®**

WHERE DO YOU WANT TO GO TODAY?™



# When Data Is Lost In Minutes, It's An Act Of God.



# When Data Is Recovered In Minutes, It's An Act Of EMC.

By the end of this sentence, an unforeseen disaster could disrupt your business. But don't worry. By the end of this ad, you won't be concerned.

Introducing Symmetrix™ Remote Data Facility (SRDF).

A revolutionary mainframe solution from EMC that ensures continuous availability of your business information.

Now, with SRDF, a recovery process that took days is reduced to minutes



*Disaster recovery in minutes, not days.*

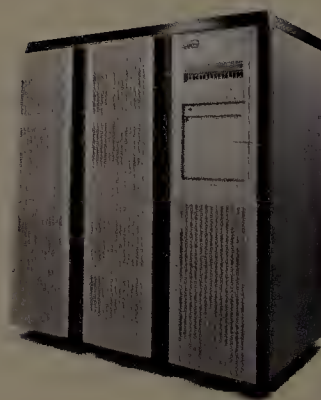


because all your data is instantaneously duplicated at a remote location, as of the last transaction, making a complete copy available in the next building, state, country or continent.

And that means no time-consuming rehearsals since SRDF is automatic and doesn't require people, eliminating human error.

No CPU overhead or host intervention.

No loading tapes onto



trucks for a costly road trip.

Simply bullet-proof, fault-tolerant recovery that doesn't

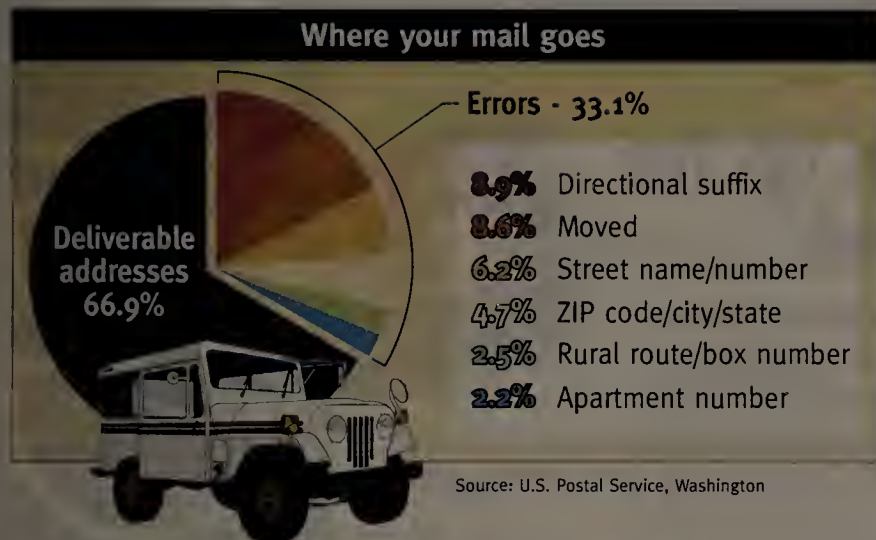
degrade on-line performance. Or your company's bottom line.

Symmetrix Remote Data Facility. When it comes to keeping your business running through anything, it's nothing short of a miracle.

For more information, please call 1-800-424-EMC2, ext. 201.

**DATA RECOVERY IS IMPROVED BY A FACTOR OF EMC<sup>2</sup>**  
THE STORAGE ARCHITECTS





## Postal software helps firms beat high rates

By Mitch Betts

While consumers faced a new 32-cent postage stamp at the start of the year, the U.S. Postal Service rate hikes hit businesses even harder. Third-class postage jumped 14% and second-class postage jumped more than 19%.

But large corporate mailers are fighting postage increases with software that cleans up addresses, adds bar codes and presorts mail to get postal discounts.

"Of course, we can't undo the rate hikes, but we can offset some of the increases," said Linda Behr, director of advertising mailings at ITT Hartford Life & Annuity Insurance Co. in Hartford, Conn.

By striving to get the maximum discount on its bulk mailings, ITT Hartford is able to save \$135,000 a year on its 23 million mailings, Behr said. The company uses mainframe software packages from Group 1 Software, Inc. in Lanham, Md., to presort its bulk mail, which is then sent to the proper regional processing center of the Postal Service.

### Reducing steps

In essence, preprocessing eliminates the step of taking the mail to a local post office. "We're doing more of the processing—what the receiving post office used to do," Behr said. The Group 1 software runs on an Amdahl Corp. 5990 mainframe.

Similarly, Chase Manhattan Bank NA in New York uses mainframe software from Group 1 and La Crosse, Wis.-based Postalsoft, Inc. to presort bulk mailings, verify nine-digit ZIP codes and add postal bar codes, said Ronald Dhanram, second vice president of mail processing. Switching from

impact printers to laser printers has improved the legibility of the bar codes, which reduced the cases of returned mail, he said.

### Accuracy = speed

By April 1, Chase plans to upgrade to Group 1's Code-1 Plus software to allow on-line verification of ZIP codes. Dhanram said he expects to save \$500,000 on the 110 million statements Chase will mail this year.

Verification of correct ZIP codes and bar codes is vital to speedy and accurate mail delivery, said Marcus Smith, editor and publisher of "Postal World," a newsletter in Rockville, Md. He said the codes should be verified using Postal Service-certified software; "otherwise, you'll send the mail really fast to the wrong place."

The postal codes provided by some popular PC word processing packages are not certified, so users risk misdelivery, Smith cautioned. "Computer users are used to the notion that one digit wrong in a telephone number or one letter wrong in an electronic-mail address will not work, but they are careless with mail addresses."

"The bar codes, when properly generated, really speed up delivery. In a test, we sent 250 bar-coded pieces of third-class mail from Gaithersburg, Md., on a Friday evening, and they were delivered in Alaska by the following Monday," Smith said.

He said the next step in improving mail delivery is for employees to enter Postal Service-certified ZIP codes and properly formatted addresses into corporate databases for regular correspondence. "The quality of the address is directly related to how quickly the mail will be delivered," Smith said.

## Cray fights for new users

High-end T90, low-end J90 targeted for industrial sites

By Craig Stedman

Cray Research, Inc. recently introduced the next generation of its flagship high-end supercomputers, starting a one-two punch aimed at making the company's products more appealing to industrial users.

The second punch will come next week when Cray doubles the size of its low-end J90 line to 32 processors, industry sources said. The J90 was unveiled last fall as the initial step in the company's effort to woo more industry business and reduce its reliance on the flat-trending government market.

Last year, Cray still got two-thirds of its revenue from government customers, and industry watchers said it needs to do better in the commercial sector to grow. "They've had far too large a dependence on government contracts," said Howard Richmond, an analyst at Gartner Group, Inc. in Stamford, Conn.

### One of the family

In a key change designed to encourage industrial sales, Cray is releasing the new high-end T90 as a full family of systems with one to 32 processors. Traditionally, the Eagan, Minn., company shipped only the largest configurations of its high-end machines and then waited a year or more for smaller versions.

Cray was afraid of drawing sales from its biggest systems, but that strategy became self-defeating, said Debra Goldfarb, an analyst at International Data Corp. in Framingham, Mass. "The market for \$35 million machines is very limited," she said. "Cray needed to be more in line with the way people buy products."

The North Carolina Supercomputing Center, which is scheduled to be one of the first T90 customers, would not have been in a position to buy the system so quickly if it was only offered in the full 32-processor size, said Jeffrey Husskamp, director of the center in Research Triangle Park.

The center expects to get a four-processor T90 system in late summer as a replacement for its Cray Y-MP machine, he said.

"From a competitive point of view, I think Cray was very smart to do it this way," said Dick Sherman, president of RCI Ltd., a multivendor supercomputer user group in Minneapolis. The company "has acknowledged that it's a buyer's market now, not a seller's market," he said.

Whereas Cray in the past often displayed "arrogance," management changes late last year have led to "dramatic improvements in its marketing orientation," he added. Robert

Ewald, Cray's new president and chief operating officer, is a former supercomputer user and "understands the user point of view," Sherman said.

In fact, the first T90 systems to ship around midyear will be the smaller versions, Cray said.

Full configurations are due to follow by year's end. In another first, models with up to four processors will not require external liquid cooling, although they cannot be upgraded without the plumbing.

A total of eight T90 systems are on order so far, and one was installed for testing purposes at an undisclosed customer site in December, Cray said. The system, which starts at \$2.5 million, can do up to 60 billion calculations per second, compared with a peak of 16 billion on the predecessor C90, it added.

### Downward trend

Meanwhile, the expansion of the low-end J90 will give Cray a longer upgrade path that may help differentiate those systems from competing machines and workstation clusters sold by Silicon Graphics, Inc. and IBM, said Rich Partridge,

an analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. The J90 is a critical product because high-end supercomputer demand is flat, but Cray is playing catch-up in the low end of the market, he said.

Cray had a less than rousing 1994 marked by modest revenue growth and a decline in profits, which went from \$60.9 million in 1993 to \$55.7 million last year.

### Less is better

The design of the T90 eliminates more than 36 miles of internal wiring that is part of the current generation of C90 supercomputers,

Cray said. The company developed connectors that directly link the T90 processor modules to memory, eliminating the need for interconnect wires. Modules can be installed or removed by applying low voltage to disengage the connectors.

### T party

**Cray's new T90 family of high-end supercomputers includes the following features:**

- ▶ Processors: One to 32
- ▶ Performance: 1.8 billion to 60 billion calculations per second
- ▶ Memory: 512M to 8.2G bytes
- ▶ Cooling: Air or liquid for up to four CPUs; liquid on larger models
- ▶ List price: \$2.5 million to \$35 million
- ▶ Availability: Second half of this year

This year is expected to be even worse, with the company predicting a revenue drop and break-even results at best. Some of that is the result of the high-end product transition, but Cray also faces lower selling prices, increased marketing expenses and a sharply reduced order backlog.

According to Goldfarb, the T90 and J90, plus the recent management changes, put Cray in position to rebound. "From a product standpoint, the company has never been stronger," she said.



# OBJECT WORLD

## Objects In The Real World 1995

### Don't miss Object World Boston. Sign up for your FREE Exhibits Pass—a \$50 value!

Maybe three days at Object World Boston won't make or break your career. But why take chances? Come to the only all-OT, east coast event that focuses on both the technical and business aspects of applying object technology in the real world. Join us for three days of exhibits, Bonus Sessions, Exhibitor Seminars,

Keynote Presentations, and special events. It's all FREE. To preregister, call (800) 225-4698 or complete and return the reply form below by March 15. Or simply bring it to the show. Don't get lost in the shuffle. Come to Object World Boston.



**Your FREE exhibits pass—a \$50 value—is your ticket to:**

**Three days of exhibits.** The Object World exhibit hall will be overflowing with excitement as more than 75 companies present the hottest new products and services in object technology.

**Attend Exhibitor Seminars.** These dynamic sessions are your chance to learn directly from the people who design and create OT products. Find out about the most up-to-date tools and services and how they're being applied.

**Hear from industry leaders.** They've been there. They've seen it. They've done it. And now the movers and shakers of OT are eager to share their knowledge and experiences with you. Don't miss Object World's daily keynote addresses.

**Get the inside story at our Bonus Sessions.** Learn the ins and outs of object technology during several 45-minute sessions open to all attendees. Topics covered include: Focus on OMG, Standards, Introduction to OT Concepts, and Industries in Action covering healthcare, financial services, and telecommunications.

**Buy autographed copies of OT best sellers.** Meet noted industry authors and walk away with your own personally autographed copy of the latest titles in OT. Look for Quantum Books on the exhibit floor.

#### It's easy to register

**BY PHONE:** Call us toll free at (800) 225-4698 in the U.S. or (508) 879-6700. Please complete the registration form before you call.

**BY MAIL:** Fill out this form and mail to IDG World Expo, 111 Speen Street, P.O. Box 9107, Framingham, MA 01701.

**BY FAX:** For fastest service, fax us at (508) 872-8237.

**BY WORLDWIDE WEB SERVER:** To access: <http://www.idgweb.com> Select: Object World Boston.

**Test drive the Information Superhighway.** Cruise down the open road on any of our Internet Terminals. Access the new electronic frontier including the World Wide Web. Look up your local weather forecast. Take part in group discussions. Tap into research on computer companies.

**Vote for your favorite new product.** Witness live demonstrations of new products and tell us which one you think is best at the 2nd Annual Computerworld Best New OT Product Awards Competition. Both the Attendees' and Industry Judges' Choice winners will be announced on the show floor on Wednesday, March 22, at 4:30 p.m.

**Tip your glass at the Boston Beer Tasting Reception.** Belly up to the bar and sample beer from famous Boston area breweries like Samuel Adams, the Commonwealth Brewery and others on Wednesday, March 22, at 5:00 p.m.

**Receive valuable show coupons.** Save on the latest in hardware, software, and services with hundreds of dollars worth of discount coupons good only at Object World Boston.

#### Get the Object World Facts by Fax!

Call our 24-hour automated fax system at (800) 486-9808 and request the following extension for up-to-the-minute information:

Bonus Sessions & Exhibitor Seminars: Ext. 496

Tutorials & Conferences: Ext. 494 or 495

Book Signings: Ext. 497

A special thanks to our special events sponsors:



#### EXHIBIT HALL HOURS

Tuesday, March 21	11:00 a.m. - 6:00 p.m.
Wednesday, March 22	11:00 a.m. - 6:00 p.m.
Awards Ceremony	4:30 p.m. - 5:00 p.m.
Beer Tasting Reception	5:00 p.m. - 6:00 p.m.
Thursday, March 23	10:00 a.m. - 2:00 p.m.

#### The biggest names in OT will display their products and services at Object World Boston.

ACM SIGAda • ADA Information Clearinghouse • AMS Training Services • *Application Development Trends* • Boston University Corporate Education Center • Cadre Technologies • *Computerworld* • Covia Technologies • The Cushing Group • *Data Management Review* • DDC-I • Digital Equipment Corporation • Ease! Corporation • Expertsoft • Extended Intelligence • Fujitsu • Hitachi • IBM Corporation • ICL • ICON Computing, Inc. • ILOG, Inc. • *InfoWorld* • Instruction Set, Inc. • IntelliCorp, Inc. • Interactive Development Environments • Intersolv, Inc. • IONA Technologies, Ltd. • JumpStart Systems, Inc. • Learning Tree International • Logiscope Technologies • Mark Winter & Associates • Martin Marietta Advanced Concepts Center • *Mass High Tech News* • Matra Datavision • McCabe & Associates, Inc. • Micro Focus • Miller Freeman, Inc. • NetLinks Technology, Inc. • Object Management Group • *Object-Oriented Strategies* • Objectory Corporation • Object Power • OpenObjects • OpenWare Technologies, Inc. • ParcPlace Systems • Powersoft Corporation • Prentice Hall • Proforma Corp. • Project Technology • ProtoSoft, Inc. • Ptech, Inc. • Rational Software Corporation • Rogue Wave Software Inc. • Select Software Tools, Inc. • Semaphore • Servio Corporation • SES, Inc. • SIGS Publications • Software 2000, Inc. • *Software Magazine* • SPL World Group Consulting • SunSoft • Syntex Corporation • Taligent • Tasken Work Environments • Texas Instruments • Unigram-X • UniSQL, Inc. • Winter, Wyman & Co.

#### Hear Keynote Presentations from Industry Leaders.

• **Objects: Not Just for Programmers Anymore.**

Tuesday, March 21, 10:15 a.m. - 11:30 a.m.

Keynote Speaker: Steven A. Mills, General Manager, IBM Software Solutions

• **Business Engineering with Object Technology.**

Wednesday, March 22, 10:15 a.m. - 11:30 a.m.

Keynote Speaker: David A. Taylor, Ph.D., President, Enterprise Engines Inc.

• **Theory is Great, But Does it Get the Job Done?**

Thursday, March 23, 9:00 a.m. - 10:30 a.m.

Keynote Moderator: Jon Hopkins, President, Palladio Software Corporation

Keynote Panelists: Grady Booch, Chief Scientist, Rational Software Corporation; Ivar Jacobson, Ph.D., V.P., Technology, Objectory AB; Stephen J. Mellor, V.P. and Founder, Project Technology, Inc.

**Need more information about Object World Boston conferences? Call (800) 225-4698.**

#### Object World Boston • Hynes Convention Center • March 21-23, 1995

**Return this coupon by March 15. Or bring it to the show for your FREE admission—a \$50 value.**

The last date to preregister is March 15. After that date, simply bring this form to the show for FREE admission. To avoid long lines at the door, register by March 1 and your exhibits pass will be mailed to you approximately two weeks before the show. You must complete Sections A-G.

Please print or type clearly. Photocopy to register additional people. No one under 18 admitted.

- ☐ Please register me for my FREE Exhibits pass.  
☐ Please rush me complete conference information.

Priority code: CW8

A. NAME \_\_\_\_\_  
TITLE \_\_\_\_\_  
ORGANIZATION \_\_\_\_\_  
STREET \_\_\_\_\_  
CITY \_\_\_\_\_ STATE/PROVINCE \_\_\_\_\_  
ZIP/POSTAL CODE \_\_\_\_\_ COUNTRY \_\_\_\_\_  
PHONE \_\_\_\_\_ FAX \_\_\_\_\_

**Be There  
Or Be  
Square.**

#### B. Your Business or Profession (Circle one):

1. Aerospace
2. Consultant
3. Education
4. Engineering
5. Government
6. Information Service
7. Insurance/Banking/Financial
8. Manufacturing
9. Professional Service
10. Retailing
11. Software Developer
12. Wholesaling/Distribution
13. Other

#### C. Your Title

14. Chief Information Officer
15. Consultant
16. EDP System/Program/Planning
17. Software Engineer
18. Engineer (other than software)
19. General Management
20. Information Systems Manager
21. Manager, Systems Architecture
22. Manager, Systems Development

#### D. Number of Employees in Your Company:

23. Under 100
24. 100-499
25. 500-999
26. 1000-4999
27. 5000-9999
28. 10,000-49,999
29. 50,000-99,999
30. 100,000-499,999
31. 500,000-999,999
32. 1,000,000 or more

#### E. Which Functions Do You Perform in Regard to Object Technology?

33. Final Decision Maker
34. Specify
35. Recommend
36. Approve
37. Develop/Use
38. Resell
39. Other

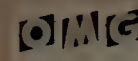
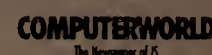
#### F. In Which of the Following Object-Oriented Products or Services Are You Interested?

40. C++
41. Eiffel
42. Smalltalk
43. Frameworks
44. Analysis and Design Tools
45. Visual Programming
46. Portable GUI Builders
47. Development Environments
48. Distributed Management Facility
49. Class Libraries
50. None
51. Databases

#### G. Internet/E-mail Address

☐ Check here if you are disabled and require special services. Please attach a written description of your needs.

Object World Boston is sponsored and produced by:



DATE  
No 5





# Take a slice off the price of COMPUTERWORLD.

51 issues for only ~~\$48~~. *Now Only \$39.95*

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$39.95\* per year - a savings of \$8.00 off the basic subscription price. Plus, I'll also receive the '94-'95 COMPUTERWORLD Salary Survey FREE just for trying COMPUTERWORLD. P/Code 98

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_  
Title \_\_\_\_\_ Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48

\* U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

- 10. Manufacturer (other than computer)
- 20. Finance/Insurance/Real Estate
- 30. Medical/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Dist./Retailer
- 95. Other \_\_\_\_\_

(Please Specify)

2. TITLE/FUNCTION (Circle one)

- IS/MIS/DP MANAGEMENT**
- 19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
  - 21. Dir./Mgr. MIS Services, Information Center
  - 22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin. Services
  - 23. Dir./Mgr. Sys. Development, Sys. Architecture
  - 31. Programming Management, Software Developers
  - 41. Engineering, Scientific, R&D, Tech. Management
  - 60. Sys. Integrators/VARs/Consulting Management
- CORPORATE MANAGEMENT**
- 11. President, Owner/Partner, General Manager
  - 12. Vice President, Asst. VP
  - 13. Treasurer, Controller, Financial Officer

**DEPARTMENTAL MANAGEMENT**

- 51. Sales & Mktg. Management
  - 70. Medical, Legal, Accounting Management
- OTHER PROFESSIONAL MANAGEMENT**
- 80. Information Centers/Libraries, Educators, Journalists, Students
  - 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems

- (a) Solaris
- (b) Netware
- (c) OS/2
- (d) Unix
- (e) Mac OS
- (f) Windows NT
- (g) Windows
- (h) NeXTstep

App. Development Products

☐ Yes

☐ No

Networking Products

☐ Yes

☐ No

E4C5-6



# Take a slice off the price of COMPUTERWORLD.

51 issues for only ~~\$48~~. *Now Only \$39.95*

Yes, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of \$39.95\* per year - a savings of \$8.00 off the basic subscription price. Plus, I'll also receive the '94-'95 COMPUTERWORLD Salary Survey FREE just for trying COMPUTERWORLD. P/Code 98

First Name \_\_\_\_\_ MI \_\_\_\_\_ Last Name \_\_\_\_\_  
Title \_\_\_\_\_ Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: \$48

\* U.S. Only. Canada \$95, Mexico, Central/South America \$150, Europe \$295, all other countries \$295. Foreign orders must be prepaid in U.S. dollars.

Please complete the questions below to qualify for this special rate.

1. BUSINESS/INDUSTRY (Circle one)

- 10. Manufacturer (other than computer)
- 20. Finance/Insurance/Real Estate
- 30. Medical/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government - State/Federal/Local
- 65. Communications Systems/Public Utilities/Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90. Computer/Peripheral Dealer/Dist./Retailer
- 95. Other \_\_\_\_\_

(Please Specify)

2. TITLE/FUNCTION (Circle one)

- IS/MIS/DP MANAGEMENT**
- 19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
  - 21. Dir./Mgr. MIS Services, Information Center
  - 22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr./PC Mgr., Tech Planning, Admin. Services
  - 23. Dir./Mgr. Sys. Development, Sys. Architecture
  - 31. Programming Management, Software Developers
  - 41. Engineering, Scientific, R&D, Tech. Management
  - 60. Sys. Integrators/VARs/Consulting Management
- CORPORATE MANAGEMENT**
- 11. President, Owner/Partner, General Manager
  - 12. Vice President, Asst. VP
  - 13. Treasurer, Controller, Financial Officer

**DEPARTMENTAL MANAGEMENT**

- 51. Sales & Mktg. Management
  - 70. Medical, Legal, Accounting Management
- OTHER PROFESSIONAL MANAGEMENT**
- 80. Information Centers/Libraries, Educators, Journalists, Students
  - 90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems

- (a) Solaris
- (b) Netware
- (c) OS/2
- (d) Unix
- (e) Mac OS
- (f) Windows NT
- (g) Windows
- (h) NeXTstep

App. Development Products

☐ Yes

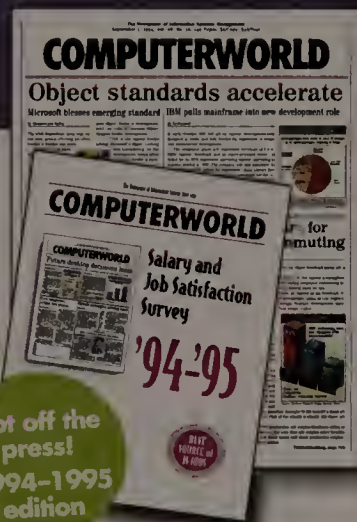
☐ No

Networking Products

☐ Yes

☐ No

E4C5-6







NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

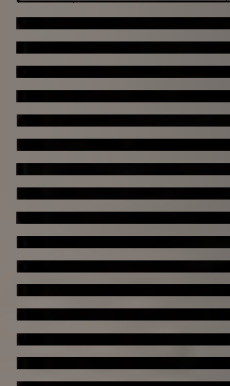
POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P O BOX 2044  
MARION OHIO 43306-4144



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS MAIL PERMIT NO. 55B MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

**COMPUTERWORLD**

P O BOX 2044  
MARION OHIO 43306-4144





# Europcar drives rocky road to Unix

By Pierre Berger and Cara A. Cunningham  
PARIS

■ After serious difficulties last April and a temporary return to its proprietary system, Europcar International SA now has one of the largest installations of a Unix-based system worldwide.

Europcar's Greenway project became operational in February. Based on Sequent Computer Systems, Inc.'s multiprocessing Pentium servers and Oracle Corp.'s database, Greenway can handle up to 4,000 users simultaneously. The databases, located in Villepinte, France, are accessible from 960 Europcar offices equipped with PCs throughout Europe. Europcar is based in Paris.

Despite Greenway's present success, neither Europcar employees nor Perot Systems Corp., which was brought in to manage the installation, are ready to forget the many sleepless nights they spent putting the system back on track following its collapse last spring.

## Maxed out

In April 1994, after appearing to be in satisfactory working condition while running 2,000 users simultaneously, some of Greenway's modules could go no further.

"We discovered some characteristics of the tuning and implementation of Oracle" that would not allow the system to fully function as it had originally been sketched out, explained Malcolm Stirling, Europcar's technical director in Villepinte.

As a result, the company had to go

back to the mainframe for a while. Although the new Oracle-based reservation system stayed up throughout Europcar's European offices, the rental and operations modules in France and Germany were temporarily returned to big iron.

"It was not that much of a crisis in the fact that we managed to continue operations from a business perspective," Stirling said. "But it did, needless to say,

of a principal server failure.

Network performance also improved, Stirling said, thanks to Ecopad from SynchroX. This terminal emulator manages characters locally on the client side and waits until a transaction is completed to transfer characters to the server for validation, he explained. Therefore, network traffic is cut back by up to 80%.

Ecopad improved the response time while also reducing the cost of transmis-

sion. But after the shock of the return to the old system and the high volumes that rental agents are faced with in the summer months, Europcar chose to wait until autumn.

## Preserving the past

The final architecture is based on Unix, yet it preserves certain traits of mainframe computing such as the way it connects workstations to a large central system. Although Europcar's 3,400 workstations are essentially PCs equipped with Windows, terminal emulation is the sole method of communication among them.

"We're keeping it simple during the first implementation," said Stirling, responding to why Europcar chose terminal emulation instead of a more client/server-style architecture.

The Greenway project's intent was clear from the beginning: to offer clients a unified service throughout Europe, promising "one system, one Europe, one service." By choosing Unix to obtain this goal — particularly on a pro-

ject of such size and importance — Europcar has proved the robustness of open systems, Stirling said.

"It was tempting to go for a traditional mainframe solution," Stirling said, because of information systems' comfort level with the tried-and-true. "But the team here had sufficient confidence in open systems. Their vision is now being realized in Greenway; you can build an open system of this scale and manage it."

Berger and Cunningham are correspondents for *Le Monde Informatique* and *IDG News Service*, respectively.

Europcar's Greenway incorporates five Sequent 2000/790 computers running Oracle databases. Greenway, which handles tasks such as reservations for the car rental company, supports up to 4,000 simultaneous users. This makes it one of the largest Unix implementations in the world. Greenway was designed and implemented in part by Perot.

## Greenway's driving force



Replacing mainframes with Unix systems is not a new idea. But Europcar's strategy of using Intel x86-based computers instead of RISC workstations is becoming a trend, according to a recent study from market researcher International Data Corp. (IDC).

In 1993, Intel-based computers accounted for 42.2% of all systems running Unix, according to IDC.

cause the staff involved a significant amount of anxiety."

The major problem came from a bug in the Oracle Parallel Server database's Lock Manager feature, which had not been fully tested under high-usage conditions. But Oracle resolved the problem within "weeks," Stirling said.

As part of the solution, the system's hardware was also reinforced. The two Sequent Symmetry 5000 SE60 servers became four — three used for production applications and one reserved for management functions and backup in case

of a principal server failure. Stirling said, which is particularly important because the project uses France Telecom's Transpac packet-switching service, which bills customers based on volume.

Following these fortifications, the system was eventually relaunched at the end of October in France and in November in Germany. The IBM mainframe that it replaced was scheduled to remain active until the end of January to manage active contracts.

Reimplementing Greenway could have happened much earlier, according to Per-

## Warehouse management

# CA unpacks client/server version of CA-Warehouse Boss

By Thomas Hoffman

Computer Associates International, Inc. has started shipping its first client/server version of CA-Warehouse Boss.

The warehouse management package provides Windows-based clients with functionality similar to what is available on the IBM AS/400 version of CA-Warehouse Boss.

But perhaps the most significant enhancements to the warehousing package are the radio frequency data collection capabilities, according to prospective customers and analysts.

The RF data collection and RF-directed warehouse management "will bring up the accuracy of our picking a bit," said Ralph Johnson, MIS director at Ansell Corp. in Dothan, Ala., a division of latex products manufacturer Ansell International in Melbourne, Australia.

Johnson said his group had been achieving 99%-plus accuracy rates on its bulk and replenishment inventories using Andersen Consulting's DCS/Logistics software on two IBM 4381 machines. But Ansell is standardizing on Windows-based clients and AS/400 servers to bring commonality to its worldwide data. So Ansell is replacing its IBM 4381s and the Andersen software with an AS/400 and CA-Warehouse Boss configuration.

## Increased accuracy

Plus, Johnson said he expects CA-Warehouse Boss to improve the accuracy of Ansell's "picking" operations — where the company's test orders are "picked" from bins and shipped to customers. These operations are currently only 75% to 80% accurate.




The RF-based warehouse management and other features have helped make CA-Warehouse Boss 4.1 "the

most robust and mature warehouse management system in the client/server environment," said Robert George, a senior analyst at Advanced Manufacturing Research, a Boston-based consultancy. George said he was also impressed with the product's enriched rules-based architecture and automated materials handling capabilities.

Future server platforms being targeted for CA-Warehouse Boss include Hewlett-Packard Co.'s HP/UX and Data General Corp.'s DG/UX Unix environments running Oracle Corp., Sybase, Inc. and CA-Ingres relational database management systems, according to John Capobianco, vice president of research and development at Islandia, N.Y.-based CA. Capobianco said the HP/UX and DG/UX ports for CA-Warehouse Boss will be announced in September.

CA-Warehouse Boss 4.1 is available now, and prices start at \$75,000.

## Key features of CA-Warehouse Boss 4.1

-  Unifies logistics management throughout the supply chain, including supplier, plant floor, warehouse and customer.
-  Supports applications running on either PCs or application servers that communicate with CA-Warehouse Boss on an IBM AS/400. The database server is built on IBM's DB2/400 relational database engine.
-  System-directed stock replenishment. The system analyzes minimum and maximum stock levels and directs replenishment during off-shift hours, reducing picking delays during peak shifts.

Prices start at \$75,000



# THE **NEW WAY** OF THINGS IS THAT **BIG** COMPANIES THINK AND

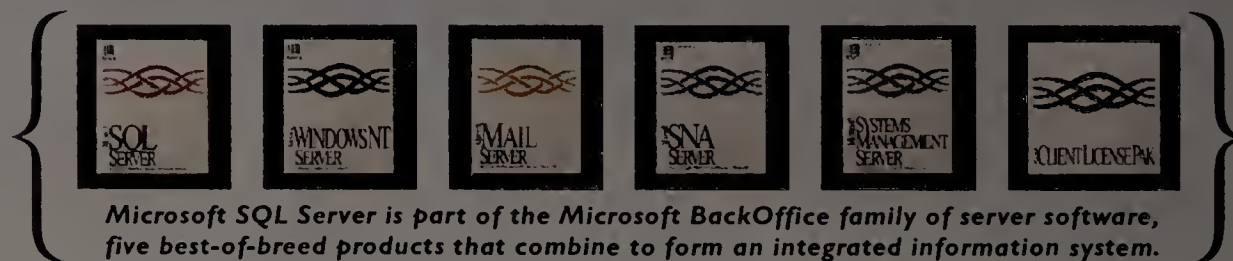
MICROSOFT SQL SERVER CAN HELP YOUR COMPANY  
NOT ONLY MANAGE INFORMATION, BUT USE IT.

The idea is simple. Put information at people's fingertips. So they can act faster. And think bigger. It's why business is turning to client-server computing. It's also why they are turning to Microsoft® to help make it happen.

In the new world of client-server computing, only Microsoft offers an integrated suite of products—Office and BackOffice—for both the client *and* the server. It creates a level of access and control that makes Microsoft SQL Server™ a powerful choice for companies—like *yours*—needing a scalable database management system for the new generation of client-server business solutions.

You're in good company. Recent surveys show that Microsoft SQL Server is among the most widely implemented client-server database platforms.\* Why? It meets demanding production requirements for reliability, availability, and fault-tolerance. In fact, Microsoft SQL Server is trusted by leading Fortune 1000 companies, such as Sea-Land, Chevron Canada, and Freightliner, to run production systems as diverse as process management, sales automation and customer service.

Thinking big? The new Microsoft SQL Server 6.0 delivers what you expect in an enterprise database management system: replication, parallel backup, ANSI compliance, and interoperability.\*\* Scalable performance? It's multiprocessor-ready to handle databases of 100 gigabytes and more. With a parallel architecture that adapts





# FAST SMALL COMPANIES THINK BIG.

IN THE **NEW WORLD,**  
INFORMATION IS THE LIFEBLOOD OF BOTH.



automatically to the workload, whether you have one user or one thousand.

As for thinking fast, SQL Server 6.0 is only the latest expression of Microsoft's commitment to client-server computing. So we've designed in capabilities that others treat as expensive add-ons. Like data replication, graphical management tools, and client connectivity. And because you can't afford to have professional staff everywhere users need information, Microsoft SQL Server is the first distributed DBMS with powerful built-in services, such as job scheduling and event management, which reduce the need for constant system supervision.

Of course, all this power to *manage* information is meaningless unless people can actually *use* it. Which is why Microsoft has designed SQL Server to integrate tightly with desktop applications. It's the first database server to support mail-enabled queries, unified log-on, OLE objects and ODBC right in the engine. All of which will make your users more effective. And your organization more productive.

Want more information? It's right at your fingertips. Call 1-800-548-8452, Dept. HUK. We'll send you detailed case studies explaining how companies have successfully implemented Microsoft SQL Server. And an in-depth review of SQL Server 6.0.

After all, since your users stand to gain all that information, why not get some for yourself?

## Microsoft®

WHERE DO YOU WANT TO GO TODAY?™



# Tandem adds Unix to Himalaya servers

Kernel layer could cut porting time from two months to a day

By Mark Halper

Tandem Computers, Inc. this week will deliver on its longtime promise to add a Unix personality to its Himalaya line of proprietary NonStop servers.

To accomplish this, the Cupertino, Calif., company will add a layer to its NonStop kernel that it claims makes Unix applications easily portable. One of the first applications Tandem will offer will be a nonstop version of Novell, Inc.'s Tuxedo on-line transaction processing (OLTP) software.

The new operating system layer, which Tandem calls the Open System Services (OSS) environment, will allow some developers to port an average Unix application to Himalaya in less than a day, according to Chris Rooke, Tandem's director of product marketing. The porting task could take other developers about two months, Rooke said, noting that the length of the task will vary with the complexity of the application.

Rooke further noted that OSS

What's new at Tandem		
Product	Availability	Price
Open System operating environment	Now	Server version: K2000, \$950; K20000, \$2,200 Application runtime version: \$650 to \$1,500 depending on server
Tuxedo transaction processing software	April for early adopters	K2000, \$31,900 K20000, \$66,700

adds support for the Open Software Foundation's Distributed Computing Environment (DCE) remote procedure calls and interface specifications.

The DCE components are intended to ease interoperability in mixed proprietary, Unix and PC shops. OSS also conforms to X/Open Co.'s XPG Release 4 and is Posix 1- and Posix 2-compliant.

As for Tandem, the addition of OSS should help the company compete with other proprietary server providers such as Hewlett-Packard Co. and IBM, which have been

## Early adopters

Tandem said OSS customers include Motorola, Inc.'s Wireless Data Group in Richmond, British Columbia; The Online Computer Library Center in Dublin, Ohio; and Kredietbank in Brussels.

adding Unix functionality for some time. Although Tandem has been talking about putting a Unix face on its NonStop line for about two years, this week's announcement will mark its first commercially available product.

"This is something they've talked about for quite some time," said Laura Conigliaro, an analyst at Prudential Securities, Inc. in New York. "It's certainly later than you would like to have seen, but the fact is, Himalaya has picked up a lot of steam. And there's no question this should help continue that."

## Strategy: To stay ahead

The OSS announcement comes on the heels of Tandem's introduction of the K line of Himalaya servers, a move that analysts said should help the company maintain its comeback [CW, Jan. 23]. Tandem recorded \$170.2 million in profits for the fiscal year ended Sept. 30, 1994, following a year in which it lost \$517.7 million.

One shop where OSS could help save Tandem is Revco D.S., Inc. in Twinsburg, Ohio. Ed Gropp, senior

vice president of information systems, said the pharmaceutical chain has been contemplating moving its Tandem-based prescription filling system to a Unix platform such as the HP 9000, which drives other operations at Revco.

Having a Unix option on the Himalaya machine might mean Revco will continue to run its prescription program on the 21 Himalayas that now support the program.

"We're looking at extending the [prescription] application as well as at other applications, and it's all under consideration as to what we do," Gropp said.

But not all Himalaya users seemed eager to add Unix functionality. A spokeswoman for U.S. Bancorp. in Portland, Ore., for instance, said IS officials there declined to discuss OSS because "in the past, we haven't had any interest in running Unix."

Meanwhile, Rooke said the Tuxedo OLTP program is not intended to replace Tandem's own Pathway OTLP. Tandem plans to support both products, he said.

## Briefs

### Mexican airline returns to Unisys

After a five-month stint on British Airways' IBM-based reservations system, Mexicana Airlines has decided to convert back to Unisys Corp.'s USAS reservation system.

### PeopleSoft doubles revenue

PeopleSoft, Inc. announced 1994 revenue of \$113 million, nearly double the \$58 million the company earned in the previous year. Profit came in at \$14.5 million, up from \$8.4 million in 1993.

### NEC sells HP Unix server in Japan

Hewlett-Packard Co. last week said it had signed a three-year deal calling for NEC Corp. to sell high-end Unix servers based on HP technology. NEC licensed the HP/UX 10.0 operating system. Under the contract, NEC will first resell HP's top-of-the-line T500 Unix server. Eventually, NEC will make its own systems based on HP's PA-RISC processor. An HP spokesman said the deal is valued in excess of \$100 million.

### Unisys signs airline

Unisys Corp. has received a \$2.2 million contract to provide information management services and client/server technologies to Malaysia Airlines for tracking freight shipments.

### CA adds to CA-Unicenter team

Computer Associates International, Inc. in Islandia, N.Y., has added to its CA-Unicenter development team, Sam Greenblatt, formerly chief technology officer at Candle Corp., and Nigel Turner, formerly vice president of application engineering at OpenVision Technologies, Inc., will join CA.

Astea International, Inc. has announced PowerHelp 2.0, help desk software.

According to the Chalfont, Pa., company, PowerHelp 2.0 includes an object-based support architecture that lets users customize call tracking, identification and resolution to address each customer's specific needs without having to change the underlying source code.

The product lets information in the database be associated with any groupings of the customer or product base. Features include support for telephony standards, Microsoft Corp. Mail integration, relational database compatibility, security and graphical notes and triggers.

PowerHelp costs \$2,500 per seat, with volume discounts available.

► *Astea International*  
(215) 822-8888

Management Robotics, Inc. has announced SuperSked 5.4, labor scheduling software for supermarkets.

According to the Boulder, Colo., company, SuperSked 5.4 automatically schedules personnel across departments and job classes within the same shift based on skills and abilities.

Tasks can be defined as service,

fixed or production. Managers can specify a skill level for each employee in each department. The product can also schedule an employee to work more than one job class during one shift in different departments.

SuperSked 5.4 costs \$2,995 for a store license.

► *Management Robotics*  
(303) 440-4191

Eventus Software, Inc. has announced WatchWorks 3.0, event monitoring software for Oracle Corp. relational database management systems.

According to the San Bruno, Calif., company, WatchWorks 3.0 forewarns administrators of potential database or system problems by automatically calling a beeper number, sending an electronic-mail message or faxing or printing information to a log file.

The product can restart a failed database or run a batch program without user interaction.

WatchWorks 3.0 monitors Oracle 6 and 7 databases. Prices start at \$1,200.

► *Eventus Software*  
(415) 871-0700

Invincible Technologies Corp. has announced the Ultimate-1/FX series of RAID Level 1 storage arrays.

According to the Franklin, Mass., company, the Ultimate-1/FX series is a 20M byte/sec. Fast Wide

SCSI-II RAID 1 subsystem that provides 3½-in. hot pluggable SCSI-II drives, redundant power supplies and N+1 cooling.

The series was designed to provide an alternative to host-based mirroring for midrange servers and workstations and allows up to 34G bytes of storage per system. Head placement is optimized on the drives, so read requests can be handled by the mirrored pair member whose read/write head is closest to the file.

Prices range from \$8,995 for a base system to \$39,500 for a 34G-byte system.

► *Invincible Technologies*  
(508) 529-3500

CMstat Corp. has introduced CMstat 5, configuration management and product data management software.

According to the San Diego firm, CMstat 5 uses a graphical user interface based on Computer Associates, Inc.'s CA-OpenRoad and gives Unix and Windows users a common desktop. Features include user-defined attributes and enhanced workflow management.

The product lets users access information in a different module without having to leave a currently active module. The database manages files and processes on the system.

Prices start at \$995 per user.

► *CMstat*  
(619) 552-6660



WHEN YOU READ  
**FOUNDATION**® software has proven itself thousands of times  
BETWEEN THE LINES  
as the complete solution for building high performance applications.  
YOU'LL REALIZE THAT  
The **FOUNDATION** family of methodology tools,  
OTHER POPULAR  
design tools, message-based architecture and repository,  
DEVELOPMENT TOOLS  
make "on-time" and "on-budget" obtainable goals.  
CAN BE A RISKY CHOICE  
It's worth your time to find out about the many new features  
FOR BUILDING  
of **FOUNDATION** products for building applications that must work.  
LARGE APPLICATIONS.

**CHOOSE FOUNDATION.®**

Please mail completed coupon, reply by fax (312) 507-0802 or call (800) 458-8851.

- ☐ Please send me product literature regarding **FOUNDATION**, the low-risk choice in a high-risk environment.
- ☐ I'd also like to receive your white paper regarding client/server methodology.



NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_ CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIP \_\_\_\_\_ TELEPHONE \_\_\_\_\_ FAX \_\_\_\_\_

Mail to: Andersen Consulting, Attn: Allyson Holmes, 33 West Monroe Street, Room 214, Chicago, IL 60603-5302  
FOUNDATION is a registered trademark of Andersen Consulting. ©1995 Andersen Consulting. Arthur Andersen & Co., S.C. All rights reserved.

CW

ANDERSEN  
CONSULTING  
Software Products



T	H	E	?
C	O	M	P
U	T	E	R
B	O	W	L

I could never get him back.

Would never want to. I alone

could reformat my hopes and

He left me swimming

dreams. I alone must match wits

in a stream of compression

in a challenge of intellectual

algorithms

stamina and tenacity, test my

computer trivia and mettle.

Conquer The Computer Bowl.

Somewhere between madness and

success lies The Computer Bowl.

The obsessive passion of technology.

Sponsor The Computer Bowl, April 20. Broadcast on "Computer Chronicles." Check your local PBS listings for day and time. Ten industry leaders in a contest of computing and trivia knowledge to benefit The Computer Museum, Boston.

Call 415-323-1909, or e-mail [welsh@tem.org](mailto:welsh@tem.org).

Presented by Apple Computer.® 

SPONSORS INCLUDE: AMERICAN AIRLINES, AMERICA ONLINE, ASSOCIATION FOR COMPUTING MACHINERY, CIRRUS LOGIC, CKS PARTNERS, COMPUTERWORLD, CUNNINGHAM COMMUNICATION, ELECTRONIC CAFE INTL., INTEL CORP., KLEINER PERKINS CAUFIELD & BYERS, POWERSOFT CORP., PRICE WATERHOUSE, PROGRESS SOFTWARE, SILICON VALLEY BANK, STRATUS COMPUTER, UB NETWORKS, AND VISIX SOFTWARE.

Film output and production: Wace USA/Walker Graphics.











## Toronto bank rolls into object mode

By Kim S. Nash

Two years ago, no one at Scotiabank had built an object, never mind written a Smalltalk application for an object-oriented database. But today, that is just what developers at the 1,200-branch Toronto-based bank are doing.

This week, Scotiabank plans to start user acceptance testing of an object-oriented deposit processing application designed to help new customers choose savings accounts. The module is one of four that make up an object-oriented banking sales and services system at Scotiabank, which operates branches in Canada and 45 other countries.

The new system will keep demographic information on individual and commercial customers and help salespeople target investment, loan and other bank products to individuals. Today, that is done largely via text-based applications or paper and pencil "and the common sense of our employees," said Drew Brown, manager of systems development at the bank.

### Testing the waters

Scotiabank has played around with object technology for about a year. Developers built simple applications with various versions of the Smalltalk development language, including products from Digitalk, Inc., ParcPlace Systems, Inc. and IBM.

Information systems managers realized that object technology "is a bit of a religious war," Brown said. So the bank hired two different

## ON SITE

### Scotiabank Toronto

**Challenge:** To move applications off IBM ES/9000 mainframes running IMS while installing databases in 1,200 local bank branches; to cut development time by reusing code.

**Technology:** Versant object database, Versant Argus; ParcPlace Systems' Smalltalk language.

**Expectations:** To reduce development costs by cutting programming staff; to find new sources of revenue by collecting demographic data and cross-selling bank products.

training and education firms to teach developers about object technology and to avoid being "pushed down one track or another," he explained. Scotiabank has spent more than \$250,000 on education related to the object project, he added.

So far, five of 30 programmers have found the Cobol-to-objects transition too difficult, Brown said, "which is fine because we have lots of legacy code to be maintained."

### Branching out

The project also marks the first time databases will reside at local branches at all. Scotiabank standardized on object-oriented databases from Versant Object Technology Corp. in Menlo Park, Calif.

By putting database smarts at each branch, Scotiabank is shooting for more customizable applications. For example, not all branches offer the same loan, investment and other programs, so applications could be modified to reflect those differences, Brown said.

Local databases also mean that each location can keep detailed data relevant to its community, passing along only the appropriate summary information to corporate headquarters.

"Today everything comes up to the host, and that's just a waste of time and resources," Brown said.

The bank aims to cut application development time by half or more once it has a foundation of objects stable enough to reuse, Brown said. But he does not expect to see that benefit for roughly three years because of a big learning—and mastery—curve for object programming. "We're committed to it long term," he said.



**Scotiabank's Drew Brown:** IS managers see object technology as 'a bit of a religious war'

### Fewer staff

The bank also has specific goals for staff reductions partly as a result of using object development techniques, Brown said. "We've said that we'd be able to... reduce the number of technical people used to build the equivalent amount of function," he said, referring to a project plan submitted to management. Brown declined to say how many IS workers are expected to be cut or redeployed.

Helping sway the bank to choose the Versant database was its Argos development environment, said Mike Myers, manager of applications architecture. Argos "gives you an active repository and framework where you can make changes to your applications by changing a base model in Argos," Myers said.

In June, the bank expects to start user testing the next module, a loan application system. The entire object system is due out by this time next year.

## Add-ons take Visual Basic beyond its limits

By Elizabeth Heichler

■ **Corporate developers using Microsoft Corp.'s Visual Basic may be pushing it to its limits, but they are able to choose from an increasing array of add-on products that enrich the development environment.**

Sheridan Software Systems, Inc. in Melville, N.Y., is launching a new version of its VBAssist set of programmer productivity tools this week. Next week, Progress Software Corp. in Bedford, Mass., will roll out a package of Visual Basic accessories from its recently acquired Crescent division.

And in recent weeks, both Performix in Westhills, Calif., and CenterView Software, Inc. in San Francisco have introduced tools for Visual Basic programmers (see chart).

"Visual Basic is a great tool, but you start realizing its limitations right away," said Christopher Waters, senior applications software engineer at SBM Computers and Communications Corp. in Easton, Pa. "VBAssist simplifies a lot of the tedious work [Visual Basic]

imposes on you."

Waters uses Visual Basic as the primary development environment for client/server applications developed for his company's customers in the manufacturing, chemical, travel and health care industries. He has used add-on products along with the Microsoft language for about three years.

Waters is beta-testing the new version of VBAssist and said he is happy with the results so far because the software's resource utilization has greatly improved.

"One of the big problems with VBAssist used to be that you couldn't keep much more open [on the Windows 3.1 desktop] than [Visual Basic] and VBAssist because you didn't have enough resources," Waters said. Now he can work with Visual Basic,

VBAssist and other Windows applications simultaneously without fear of a system crash.

VBAssist 3.5 also has a cleaner user interface than previous versions, with tools and utilities better organized than in the past, according to Lou Attanasi, project manager for design at Blackbaud, Inc. in Charleston, S.C. Blackbaud is a software company that specializes in applications for nonprofit organizations.

New features in VBAssist 3.5 include the ability to position and move controls in increments of a single pixel without using the mouse, and a clipboard history that keeps track of past clipboard items, including text, bit maps and Visual Basic controls.

VBAssist 3.5 will ship on March 15 and

retails for \$179, Sheridan said.

Elsewhere, Progress Software's Crescent division—the former Crescent Software, Inc.—plans to unveil PowerPak Pro next week. It is the first new product release since Progress acquired the Visual Basic add-on specialist in January.

A company spokesman declined to divulge pricing or details about what will be included in PowerPak Pro but said it will include existing tools from Progress and Crescent. PowerPak Pro will also include third-party Visual Basic custom controls (VBX), which are standard software components that can be included in Visual Basic applications.

All the tools and components have been tested to ensure that they work together without problems, come with a unified install procedure and will be supported by Progress although they may have been developed by small VBX shops, the spokesman added.

Meanwhile, for programmers developing client/server applications with Visual Basic, CenterView Software recently released Choreo for Visual Basic. The component-based software is now shipping and costs \$595.

### New Visual Basic add-ons

**Sheridan Software Systems**  
VBAssist 3.5  
Set of productivity tools for application developers  
\$179

**Performix**  
Drag-it/VBX  
Drag-and-drop front end for Visual Basic applications  
\$295

**CenterView Software**  
Choreo for Visual Basic  
SQL data access tools  
\$595



**M**ost client/server development tools force your programming team's applications to be driven by the outward appearance of things.

It's akin to putting up the walls, windows and doorways of a building before the foundation and support beams are in place. You can build a small cottage that way, but you can't build a safe and stable skyscraper.

The same holds true for client/server application tools. Especially if your team is working with multiple databases and extremely large communities of users. Which is why you should consider Enterprise Developer 2.0 from Symantec.<sup>TM</sup>

the data locations, and all of your application's business rules separately from the presentation services.

So before you ever design a front-end screen or graphic, you can put all of your business rules and all

provide you with all the transaction structures for your graphical user interface, delivering the complex logic that would take months to create with other client/server tools.

Bottom line: scalable and robust, enterprise-wide

*Symantec Enterprise Developer ensures that your client/server applications won't end up as great looking front-ends that are unable to stand up to the stresses of the real world.*



## IS YOUR CLIENT/SERVER DEVELOPMENT TOOL JUST A FACADE?

### ENTERPRISE DEVELOPER 2.0. FOR THE FASTEST DELIVERY OF ROBUST ENTERPRISE-WIDE APPLICATIONS.

Like all client/server development tools, Enterprise Developer provides your development team with a visual, object-oriented environment.

Unlike other client/server tools, Enterprise Developer isolates the many complex components of client/server development in its own unique SCALE<sup>TM</sup> architecture. The foundation of this architecture is a business model repository that centralizes and stores your logical data models,

your data models in place first.

Then our SCALE C++ objects

### ENTERPRISE DEVELOPER 2.0.

#### SCALE REPOSITORY

*Business Model: reverse/forward engineer logical data models from your databases. Store the business rules for all your applications.*

*E-R Diagrammer: generate diagrams for your existing databases or interactively design new data structures.*

*Database Trigger Express: optimize performance by partitioning business rule logic between client and servers through generation of database triggers.*

#### SCALE C++ OBJECTS

*Leverage the information in the business model to derive the master detail processing, business rule enforcement, multi-user access, transaction integrity and data caching behavior for each application.*

#### VISUAL ENVIRONMENT

*RAD is fostered through our active business model repository and a high level of default processing, enabling you to shrink client/server development from months to weeks.*

*VBX support: use the thousands of VBX controls available in the market today.*

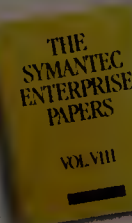
applications in record time.

So don't settle for a development tool that's just a facade. Examine the structural superiority of Enterprise Developer for yourself.

For truly robust, enterprise-wide applications, nothing stands up to it.

**DON'T SETTLE FOR A FACADE.  
CALL 1-800-488-9914.**

Ask for Ext. 9B52 and request Enterprise Developer Evaluation Program information. U.S. only. In Canada, call 1-800-667-8661, extension 5518. In Australia, call 2-879-6577.



Symantec is a registered trademark and Enterprise Developer and SCALE are trademarks of Symantec Corporation. All other brand names or trademarks are the property of their respective holders. For information in the U.K., call 1628-592222. ©1995 Symantec Corporation. All rights reserved.

# SYMANTEC.

MANAGING THE ENTERPRISE.



# Smooth transition to Visual FoxPro

By Jeffrey Gordon Angus

Microsoft Corp.'s first version of Visual FoxPro suggests that its creators have learned a lot from past efforts. The beta version of this desktop database has a promising future in helping the vast number of Xbase programmers develop object-oriented programs for Windows.

When Microsoft came out with its first Windows visual programming product, Visual Basic, it was popular, but it wasn't "Basic."

Visual FoxPro is different. You can make FoxBase programs run in Windows if you have been writing generic code. Its flexibility lets you convert slowly from old-style Xbase modes, one piece at a time, to the new style, which can greatly advance your productivity. The product also gives you access to the command line, displaying command-line equivalents of menu-executed instructions and allowing direct entry of commands.

The product's development environment centers around the Project Manager, a tabbed selection box that gives you access to all parts of the application — code, data tables, reports, queries, etc. This approach is now typical for Windows database products, but this prod-

uct provides a useful innovation. Each listed object type is part of an outline. If you double-click on the Databases selection, it opens up an indented list of the databases in the project; double-click on Table in that database, and it opens up a further-indented list of tables; double-click on a table's name, and it provides a list of fields.

From here, you can right-click on any of these objects to access a set of functions specific to them.

As a modern Windows product, the database application development environment comes with wizards — utilities that take you through a sequential set of question-and-response screens to build an object, such as a data-entry form or a report. Visual FoxPro also has wizards for making tables, queries, mail-merge operations and data import from other formats.

Visual FoxPro uses the almost universal

Windows database model of complex properties sheets that describe every attribute of every object. Properties sheets give an immense amount of information and directive muscle, but they make construction very time-consuming.

Enter object orientation. By supporting inheritance — the ability to construct an object, describe it and then copy it while retaining its attributes and behaviors — you can create a report object and

use it as a factory to generate new reports quickly. By supporting "subclassing," you can create these basic templates in a hierarchical chain of inheritance.

Developing multiuser applications is easier. New intrinsic record- and table-locking capabilities shorten code-writing time, and SQL pass-through makes Visual FoxPro a more complementary front end for client/server applications.

This beta version leaves questions open, as do all betas, which are essentially works in progress. The code is beyond big — requiring more than 40M bytes of disk space — it is s-l-o-w.

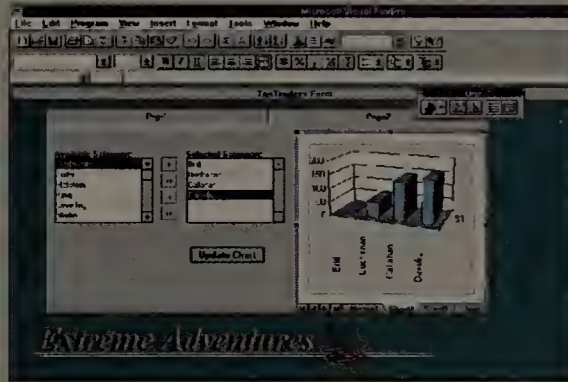
Visual FoxPro is as easy an entry into programming applications for a graphical user interface (GUI) as Windows has seen yet. It will challenge developers who have not been developing GUIs, but this version has impressive features and avoids the worst productivity failures of past attempts.

The product has not yet been priced. It is due to ship this spring.

Angus is a project director at The Data Works Ltd. in Seattle.



**Visual FoxPro 3.0  
Beta version  
Microsoft Corp.  
Redmond, Wash.  
(800) 426-9400**



Visual FoxPro's OLE 2.0 capabilities allow access to this three-dimensional Excel chart and tool bar

■ The object-oriented features of this version of the desktop database make for smoother transitions to visual environments than were possible with previous Microsoft products.

■ Despite its large memory requirement (40M bytes) and slow performance, this beta product holds a lot of promise for simplifying multiuser database application development.

*Over 750 blue chip companies  
have adopted Hyperion software.*

**So we're adopting the name for our company.**



**IMRS is now Hyperion Software.**

The new name to remember for all your financial software.



### Commentary

Frank Monteleone

# A good SAP is hard to find



All across the land, calls are being made to recruiters. The conversations go something like this:

"Get me some good people with SAP R/3 experience right away. We just purchased it and start implementation in two days. What's that? OK... OK, then any SAP experience will have to do. R2, D2, U2... I don't care, as long as they know some-

thing about SAP. What's that?... OK... They don't have to be too good, but they do have to be people. That's a firm requirement."

This feeding frenzy for SAP implementers is nuts. Consulting firms are stealing people with SAP know-how from one another and one another's clients. In fact, they are bidding so high that some SAP experts are getting salaries equal to that of a utility infielder on the Cincinnati Reds (or what it was before baseball went on a temporary leave of insanity).

In any free market, the price will continue to rise when demand is increasing faster than supply. SAP continues to sell software faster than people are learning

it. Because consulting companies are cornering the market on the small supply of SAP expertise, they are getting fat on SAP implementation projects and are passing the increased costs on to the customers who purchase and want to quickly implement SAP.

This situation is causing some disillusionment with R/3, which is otherwise regarded as a very good product. In fact, some people are mad as hell.

Having directed a project that selected R/3 for a re-engineered supply chain process — and then leading (while simultaneously being led by) a consultant to implement it — I considered capitalizing on this knowledge and getting myself a 900 number to offer expensive advice (1-900-CALL-A-SAP for \$14.99 per minute). But because I don't like talking on the phone all day, I've decided to share it through this fine publication instead.

R/3 differs from other software packages in the following ways:

- It's really more of a customization than an implementation.
- The users of the system — not a bunch of programmer/analysts — need to customize it. If the users know Windows, they can navigate through SAP screens. Their knowledge of your business process is the critical success factor. Your IS people know your data and need to team with users on an equal basis.
- R/3's strength is the integration of the modules. This is also a source of anguish when you implement only some of those modules. It is why you need to find, or make, those scarce SAP specialists.
- It's not as hard to learn SAP as everyone seems to think. It's just the number of implementation options that intimidates people.
- R/3 will probably force you to change some of your processes to fit within its range of tailorability. Modifying

SAP code is suicidal unless you can persuade SAP to do it and incorporate the changes into the product.

### Some other pieces of advice

- SAP implementers/specialists don't exist — not in the U.S. anyway. So stop looking for them for at least 18 months.
- It's best to train your own people anyway. Do it as soon as possible and install a test system so they can experiment. The best way to learn SAP is hands-on training.
- You can get help with the initial implementation of SAP by using the initials IBM, DEC or HP. Each of these hardware vendors has knowledgeable people who can help size (for a size) and install SAP. If you're real nice to them, they will even sell you some hardware to use as database and application servers.
- The most critical person you need is a good project manager. He needs a high-level SAP consultant to create a realistic implementation strategy. This is who you should spend the big bucks to get from a consultancy.
- If you do hire implementation consultants, make sure you have at least a 50-50 mix of your own people on every phase of the project. Don't let your project become a training ground for a bunch of consultants who will learn at your expense and take that knowledge out the door with them.

One final piece of free advice. Not only should you invest significantly in training your people for a SAP conversion, but you should also give them incentives to stick around until it's complete. Otherwise, their phones will be ringing — and it won't be the Cincinnati Reds looking for a second baseman.

Monteleone is an information technology director in the Midwest and can be reached at [fmmt@aol.com](mailto:fmmt@aol.com).

*Now, accounting software that works as well as the most successful financial reporting software.*

## Introducing

Hyperion

# Financials

An integrated client/server solution for financial management to drive your business into the next century.



## Application Development

**Poet Software Corp.** has announced Poet 3.0, object database software.

According to the San Mateo, Calif., company, Poet 3.0 stores C++ objects to be used and shared on numerous desktop platforms.

The product features a C++ application programming interface that lets users program via the Poet class dictionary. Microsoft Corp.'s Object Linking and Embedding 2.0 and Object Database Connectivity are supported. Database features include on-line backup, object check-in/check-out and an object query language subset.

Poet 3.0 Personal Edition costs \$499. Poet 3.0 Professional Edition for Windows for Workgroups costs \$1,999.

► *Poet Software*  
(415) 286-4640

**Adaptive Solutions, Inc.** has announced CNAPS/PC, a Windows software development environment for image processing and recognition applications.

According to the Beaverton, Ore., company, CNAPS/PC lets users write parallel processing programs from a PC. Tools include a parallel C compiler, assembly language and assembler as well as a debugger.

The product operates as a parallel coprocessor, leaving the main CPU to control system and interface tasks.

CNAPS/PC costs \$9,995.

► *Adaptive Solutions*  
(503) 690-1236

**Thompson Software Products** has announced TeleUse/Win, an interface development environment.

According to the San Diego company, TeleUse/Win lets users develop and migrate the Open Software Foundation's Motif graphical user interface Unix applications to Windows. TeleUse/Win16 automatically maps OSF/Motif widgets to Windows objects and generates native C++ code.

TeleUse/Win32 lets users port TeleUse-generated applications to any 32-bit PC running Microsoft Corp.'s Windows NT. The product uses the standard X/Motif application programming interface and a class library that translates OSF/Motif components into a Windows look and feel.

TeleUse/Win costs \$3,500 for a single development license.

► *Thompson Software Products*  
(619) 457-2700

**Advanced Software Technologies, Inc.** has announced Graphical Designer, a Unix-based computer-aided software engineering tool.

According to the Littleton, Colo., company, Graphical Designer speeds the development of applications for Unix, Windows and Macintosh platforms.

Users can select an object-oriented methodology or create a custom methodology to express high- or low-level designs in a graphical format.

Prices start at \$4,999 for the first seat.

► *Advanced Software Technologies*  
(303) 730-7981

**TechBridge Technology Corp.** has announced TechBridge Builder for OS/2 1.2, a visual development tool.

According to the North York, Ontario, firm, TechBridge Builder for OS/2 1.2 provides an object framework that interfaces with DB2 and includes transaction management, work unit integrity, schema importing and catalog fetching.

Features include a master detail data display, notebook control within a form, automated display of three-dimensional graphics on a query form and support for IBM's OS/2 Warp.

TechBridge Builder for OS/2 1.2 costs \$2,850 for the enterprise version.

► *TechBridge Technology*  
(416) 222-8998

**Digitalk, Inc.** has announced Visual Smalltalk 3.0 and Visual Smalltalk Enterprise 3.0, client/server tools.

According to the Santa Ana, Calif.,

company, the products feature source and binary portability between OS/2 and Microsoft Corp.'s Windows NT, a binary format, improved memory management tools and support for IBM's System Object Model and Distributed System Object Model. The tools also provide more than 70 prebuilt parts and 2,000 classes.

Visual Smalltalk Enterprise 3.0 provides a team development framework as well as a library builder/binder, configuration management and Intersolv, Inc.'s PVCS Version Manager software.

Visual Smalltalk 3.0 costs \$1,495, and Visual Smalltalk Enterprise 3.0 costs \$4,995.

► *Digitalk*  
(714) 513-3000

**Visible Systems Corp.** has announced Visible Analyst Workbench (VAW) 5.4, a computer-aided software engineering application development tool.

According to the Waltham, Mass., firm, VAW 5.4 includes an enhanced Powersoft Corp. PowerBuilder interface, Uniface bidirectional interface support and enhanced repository customization capabilities. It also includes enhanced relational database management system importing and exporting and a repository-based object format.

Prices start at \$2,795.

► *Visible Systems*  
(617) 890-2273

A financial system that reflects the way you do business.

Immediate on-line access to any view of your business, anywhere in the system.

You'll need fewer reports and spend less time preparing each one.

Flexibility to meet the toughest business challenges.

Significantly more productive than current systems. Fast installation. Easy maintenance.

More efficient accounting. More time for analysis.

Hyperion

ledger

Hyperion

tools

Hyperion

reporting

Hyperion

payables

Hyperion

admin

Hyperion  
software

The new name to remember for all your financial software.

For more information call Carolyn Simon in Stamford, Connecticut.

**1-800-286-8000**



---

# CODE. Hundreds of top technology companies working toward one common goal. Your success.

---

CODE makes good on the promise of advanced, open client/server development by giving you the freedom to choose the best products. Top technology companies offering hundreds of integrated, tested and proven products ranging from business modeling to distributed computing, systems management and more.

to provide you with products and solutions that will assure your success in client/server development. And because CODE continues to evolve, you'll remain on the cutting edge with the best and latest client/server solutions. Find out how you can put CODE to work for you. Call our partners at their listed numbers. Or call us at 1-800-395-3525.

#### Programming Tools

Automated Testing  
Design & Analysis  
CASE/Methodology  
Class Libraries &  
Application Templates  
Custom Controls  
Version Control &  
Configuration  
Management  
Repository  
Re-engineering

#### Data Sources

SQL Database  
SQL Database via ODBC  
Object-oriented Database  
Middleware Gateways to  
Mainframe Data  
Host Connectivity



#### Enterprise Architectures

Electronic Software  
Distribution  
Distributed  
Computing/DCE  
Networking  
Systems Management  
OLAP Servers

#### Enterprise Workgroup Computing

EIS/Decision Support  
Graphics  
Groupware  
Imaging & Document  
Management  
Mapping  
Reporting  
Telephony & Voice  
Processing  
Text Processing & Retrieval  
Workflow

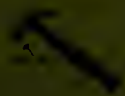
---

## C O D E : C l i e n t / s e r v e r O p e n

---



## Powersoft CODE Partners Include:



### PROGRAMMING TOOLS

#### Automated Testing Tools

##### **Manvey Interactive (408) 987-0100**

Manvey Interactive & LoadRunner: leaders in automated & multi-user testing of PowerBuilder applications.

##### **QA, Inc. (800) 328-0422**

QA TeamTest for PowerBuilder: premier solution for testing PowerBuilder client/server applications.

#### CASE/Methodology

##### **LBMS (800) 345-1812**

LBMS provides configuration management and bi-directional design links with PowerBuilder.

##### **Power Software (800) 732-5227 ext. 184**

Power Software - The price/performance leader in CASE/Methodology tools. Try it free for 30 days.

#### Version Control

##### **RTI (800) 547-7827**

RTI manages individual PowerBuilder Library objects seamlessly from within the Library Painter.

#### Additional Programming Tools Partners

**TESTING TOOLS** AutoTester, Inc. • Segue Software, Inc. •

Sterling Software • Softbridge Automated Test Facility

**CASE/METHODOLOGY** Chen & Associates, Inc. • S-DESIGNOR

**VERSION CONTROL** Legent Corp. • Mortice Kern Systems •

LBMS

**CLASS LIBRARIES & CUSTOM CONTROLS** Greenbrier & Russel, Inc. •

MetaSolv Software Inc. • Millennium, Inc. • OSoft

Development Corp. • PowerCerv • Server Logic Corp.

**HELP AUTHORING TOOLS** Blue Sky Software Corp.

**PROCESS MANAGEMENT TOOLS** Corporate Computing International



### ENTERPRISE ARCHITECTURE

#### Distributed Computing

##### **Transarc & Arbor (800) 453-4317 ext.**

Transarc & Arbor: premier distributed computing system for multi-site environments.

#### Additional Enterprise Architecture Partners

**DISTRIBUTED COMPUTING** Transarc Corp.

**OLAP SERVERS** Arbor Software Corp.



### DATA SOURCES

#### Database

##### **Informix (800) 438-7627**

Online Dynamic Server™ parallel database exploits both SMP and uniprocessor architectures.

#### Database/ODBC

##### **Tandem Computers (800) 482-6336**

NonStop SQL/MP: from \$25K, the fastest, most scalable parallel database supporting ODBC access.

#### Host Connectivity

##### **DCA (404) 442-4000**

IRMA ToolSet: Seamlessly integrates host-based information into new PowerBuilder applications.

#### Additional Data Sources Partners

**DATABASE** IRI Software • Sybase

**DATABASE/CONNECTIVITY** MDI (a Sybase Company)

**DATABASE/ODBC** Vmark Software, Inc.

**NAVIGATIONAL DATABASE** Btrieve Technologies, Inc.

**HOST CONNECTIVITY** Attachmate Corp. • NetSoft



### ENTERPRISE WORKGROUP COMPUTING

#### Text Retrieval

##### **Reliance Technologies Inc. (800) 385-2786**

SmartServer Advanced text retrieval accesses unstructured corporate information in documents and databases.

#### Additional Enterprise Workgroup Computing Partners

**TEXT PROCESSING** Folio Corp.

**IMAGING & DOCUMENTATION MANAGEMENT** Wang Laboratories

**MAPPING & DATA VISUALIZATION** Strategic Mapping, Inc.

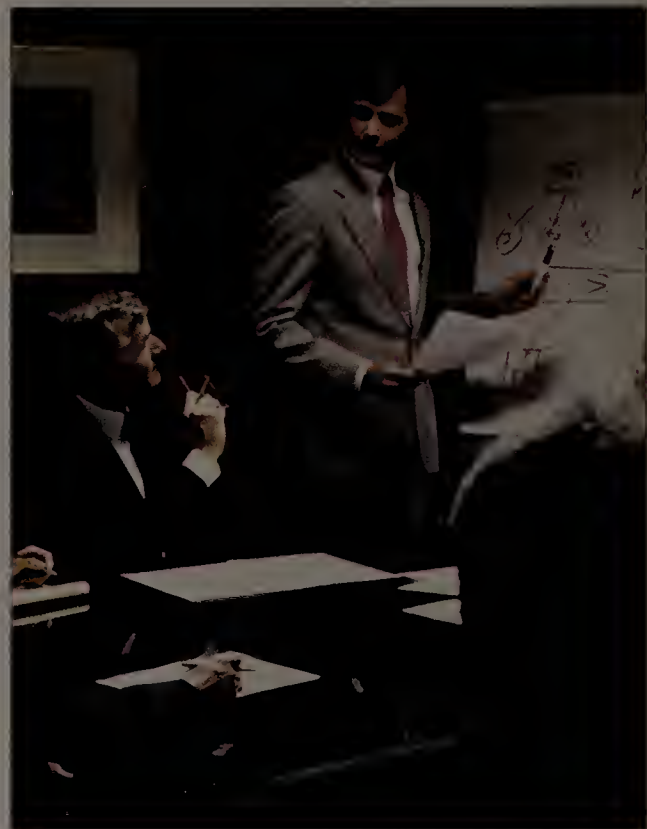
**WORKFLOW** PowerCerv

**POWERSOFT** BUSINESS  
PARTNER  
  
**CODE**

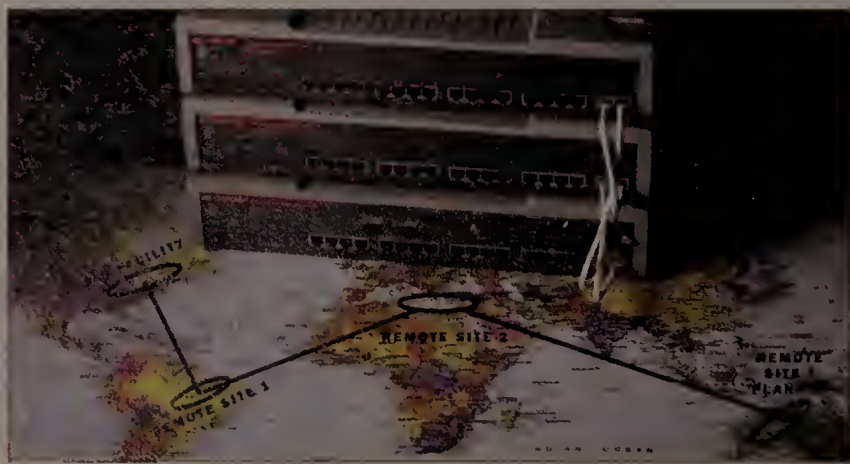
# Development Environment.



# Smart Networks for Smart People.<sup>TM</sup>



Make Your Remote Sites Enterprising.



## ONsemble StackSystem.<sup>TM</sup>

A complete system of Token Ring and Ethernet solutions  
for remote sites and campus networks.

Fault tolerant. Remote controllable. Auto configurable.

Call 1-800-228-9930.

 **CHIPCOM<sup>TM</sup>**



# Tunnel Vision

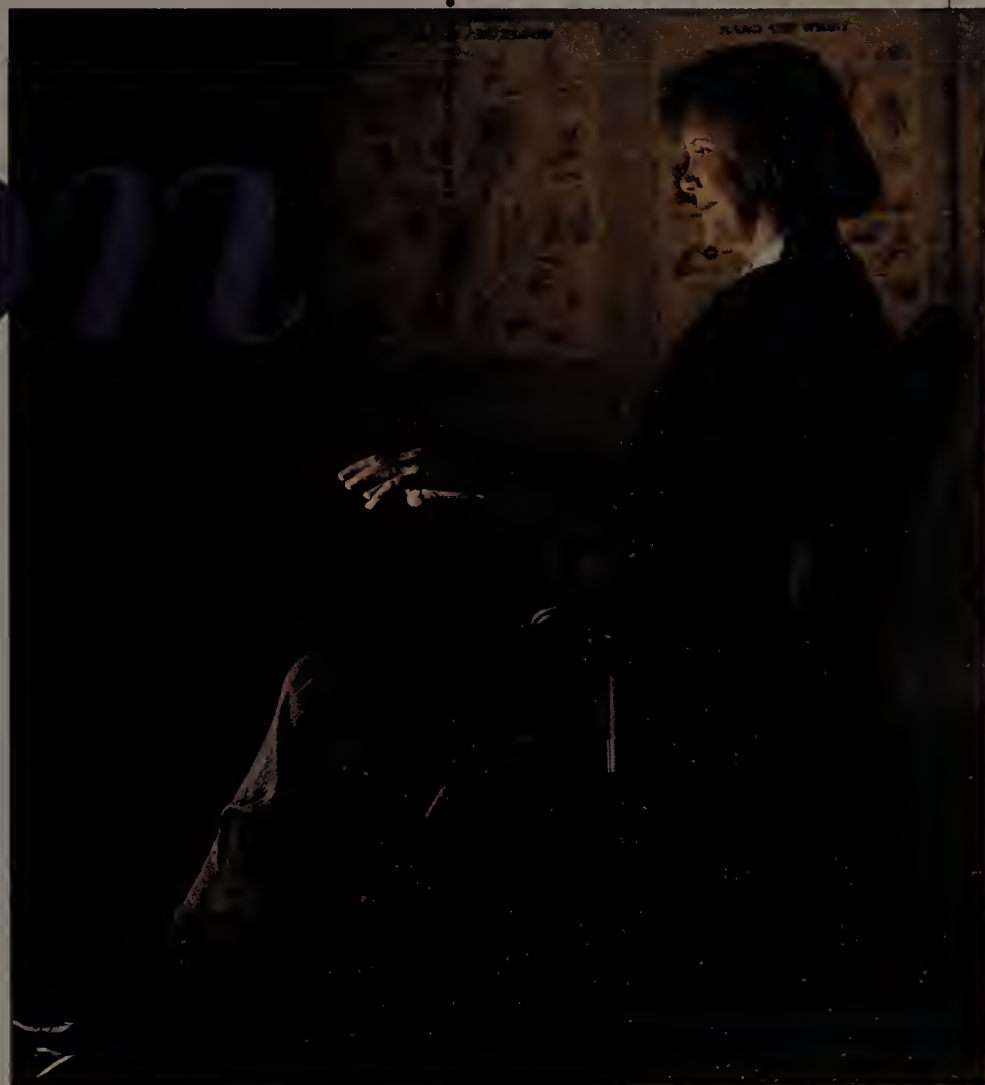
Information systems departments hold the key to making ergonomics problems better or worse for computer users, but their lack of involvement is often painfully obvious.

By  
**Robert S.  
Dieterich**

**T**om Cosentino, a health and safety manager at Hoechst Celanese Corp. in Bridgewater, N.J., found a simple way to drive home the message that his company needed a computer ergonomics program.

"I convinced my boss really easily," he explains. When his boss was present, Cosentino asked one of the

company's secretaries how her hands felt: "She said, 'Oh, they go numb after about half an hour of typing, but if I



STEVE WOLT

## GOOD IS INTENTIONS GONE BAD

*IS departments often create or compound ergonomics problems by not planning properly. Common examples include the following:*

### Example #1

- ◆ **Action:** IS planners decide to install Windows for a group of users who have their keyboards on adjustable trays beneath their desktops.
- ◆ **Problem:** You can't use a mouse on a keyboard tray, so everyone is reaching to the desktop to use the mouse.
- ◆ **Result:** Strong likelihood of causing arm and shoulder pain. A trackball is often a workable solution.

### Example #2

- ◆ **Action:** IS managers decide larger monitors are needed, which would appear to be an ergonomics plus.
- ◆ **Problem:** They don't fit on the workstations, so the monitors are placed at an angle, and the keyboard is placed wherever it fits.
- ◆ **Result:** Within a few weeks, staffers are developing neck problems.

Source: Robert Bettendorf, president of the Institute for Office Ergonomics in Manchester, Vt.

shake 'em real hard, the feeling comes back.'" Cosentino received the go-ahead for an ergonomics program, and the secretary's symptoms improved.

Ergonomics is a science that aims to make machines easier and safer to use. Cosentino says a well-designed ergonomics program forms a bulwark against cumulative trauma disorders (CTD), a group of diseases affecting the musculoskeletal system that are caused by repetitive motions such as typing.

By most reports, ergonomics is not a field that IS professionals have embraced. Steve Koppel, spokesman for the Society for Information Management in Chicago, concedes that his organization has done nothing in this area. "It's probably more of a human resources thing," he says.

But ergonomists, trainers, safety experts and facilities managers say IS departments, whether they know it or not, hold the key to making CTD problems better or worse.

"When I first meet a new client's ergonomics team, I say, 'Where's the guy Tunnel vision, page 78

◆ **Nancy Larson,** ergonomics specialist, *American Express*



## Tunnel vision

Continued from page 77

from IS? I usually get this blank look," says Robert Bettendorf, the consultant who designed Hoechst Celanese's program. The IS group is responsible for selecting and purchasing new equipment, he points out; more often than not, IS staffers install the hardware on employees' desks.

"The bottom line is that the IS people need to be involved in this issue, and they're not," says Bettendorf, president of the Institute for Office Ergonomics in Manchester, Vt.

### A high price to pay

Cosentino, who monitors the health of approximately 500 computer users, raises strong arguments in favor of addressing computer ergonomics. First and foremost: A CTD outbreak can be expensive.

The secretary with the numb hands was exhibiting symptoms of carpal tunnel syndrome.

**"When I first meet a new client's ergonomics team, I say, 'Where's the guy from IS?' I usually get this blank look.... The bottom line is that the IS people need to be involved in this issue, and they're not."**

*Robert Bettendorf, president of the Institute for Office Ergonomics in Manchester, Vt.*

One of the most disabling conditions under the CTD rubric, carpal tunnel syndrome is caused when inflammation and swelling from repetitive movements and other factors pinch the median nerve where it passes through the bones of the wrist. First comes a loss of feeling in the hand and then a loss of strength. In severe cases, even simple tasks become difficult and extremely painful.

The government reports that no workplace injury or illness requires a longer recovery period than carpal tunnel syndrome: A worker suffering this condition spends a median time of 32 days away from work, according to statistics released last year by the Department of Labor. That translates into employer expenses for lost productivity, workers' compensation and medical treatment.

In this case, the secretary's workstation was adjusted (the work surface she typed on needed to be lowered — a common problem), and she attended a training session to learn how to work more safely. Her symptoms have gone away, Cosentino says.

He emphasizes that problems such as these are not widespread at Hoechst Celanese. He was not reacting to an outbreak of CTD but was acting on the potential for a problem. In this

field, prevention is clearly better than cure: "The motivation is to keep the number of people with CTD problems very low," Cosentino says.

Reducing the number of injured employees is the "hard dollar" justification a manager needs to recommend an ergonomics program to cost-conscious executives, according to Nancy Larson, an ergonomics specialist at American Express Financial Corp. in Minneapolis. But it is the prevention of CTDs that will show up in workers' compensation claims, medical claims, missed work and restricted work statistics and government health and safety logs.

Larson, who oversees ergonomics programs for 4,000 home office employees, says an ergonomics program has another important benefit: It tells employees that the company values their health and the work they do.

### Working solution

At American Express, the number of injury claims was increasing by approximately 20% per year, Larson explains. They remained at a low level compared with other similar work environments, she says, but the trend was worrisome. The program is still new, but Larson sees indications that it is working. In a survey of employees, the number of people reporting almost daily musculoskeletal discomfort dropped from 11% of employees in 1993 to 7% in 1994.

Wayne Maynard, an ergonomist and director of training at Liberty Mutual Insurance Group in Boston, confirms the high toll that ergonomics problems take on workers' compensation benefits. In some industries, he says, it is the single biggest, most expensive compensation



### FOR MORE INFORMATION

♦ IS managers seeking information on how to prevent ergonomics problems may want to attend the Human Factors and Ergonomics Society's 39th Annual Meeting Oct. 9 to 13 at the Sheraton Harbor Island Hotel in Santa Monica, Calif. This year's theme will be "Designing for the Global Village."

♦ The meeting will feature more than 100 technical sessions on a range of ergonomics issues, including computer systems, office ergonomics, carpal tunnel syndrome, people with disabilities, medical systems, safety, environmental design, systems development and organizational design and management. For information, contact the Human Factors and Ergonomics Society, P.O. Box 1369, Santa Monica, Calif. 90406, call (310) 394-1811, fax (310) 394-2410 or via CompuServe at 72133.1474@CompuServe.com.

category.

Like Larson, Maynard argues that awareness of ergonomics must cut across departments. "Human resources people are generally aware of this issue," he says. IS managers are less so.

What role does IS play? As often as not, IS departments cause more ergonomics problems than they solve.

Bettendorf points to many pitfalls. For example, IS planners may decide to install Windows for a group of users who have their keyboards on adjustable trays attached beneath their desktops. "And guess what? You can't use a mouse on a keyboard tray, so everyone is reaching to the desktop to use the mouse," he says. This is a good way to cause arm and shoulder pain, Bettendorf says.

Overall, Bettendorf argues, ergonomics need not impede anyone's technology plans. "But IS departments can create a lot of havoc if they don't do the proper planning."

### Sharing the burden

Any number of departments can have the ultimate responsibility for ergonomics, says Larson, who is in the facilities group. The manager responsible for ergonomics could also be found in risk management, human resources or IS. The important thing, in Larson's view, is that someone has ergonomics "at the top of the to-do list." And regardless of who drives the effort, "for a comprehensive program, the IS side needs to be involved," she says.

"Ergonomics belongs everywhere," Larson adds, "and that's part of the dilemma." If the right people are not involved, you're asking for trouble. On the other hand, everyone can benefit when an ergonomics program becomes an integrated part of a company's technology management.

Larson says the relationship between her department and IS has begun to move in two directions. Currently, she is helping assess what job functions would benefit from having larger monitors, "based on productivity issues and the criticality of errors," as the company upgrades to OS/2.

This knowledge will help IS spend money where it can have the greatest impact.

"As long as it's supported, everyone benefits from a strong ergonomics program," Larson says. ■

Dieterich is a freelance writer in New York.

### PORTRAIT OF A CTD OUTBREAK

The Los Angeles Times staff suffered an outbreak of CTD in the late 1980s, prompting a large-scale study by the National Institute for Occupational Safety and Health in Cincinnati.

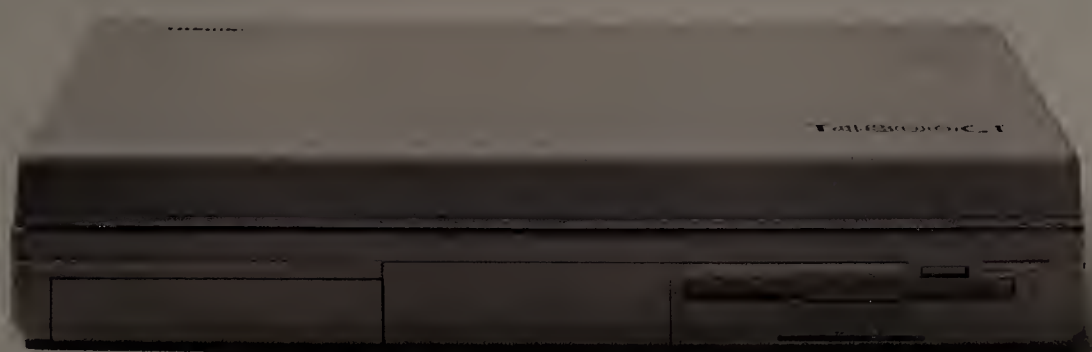
♦ Percentage of LA Times employees reporting CTD symptoms in these areas of their bodies:

Neck	26%
Shoulder	17%
Elbow	10%
Hand/wrist	22%
Any type of symptom	41%

**What does it cost the company?** In the above cases, 30% to 40% saw a health care provider. Between 10% and 20% missed at least one day of work.

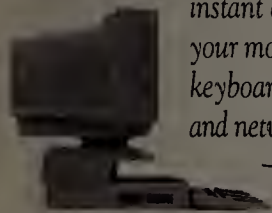


# 75MHz.



## OPEN 'ER UP.

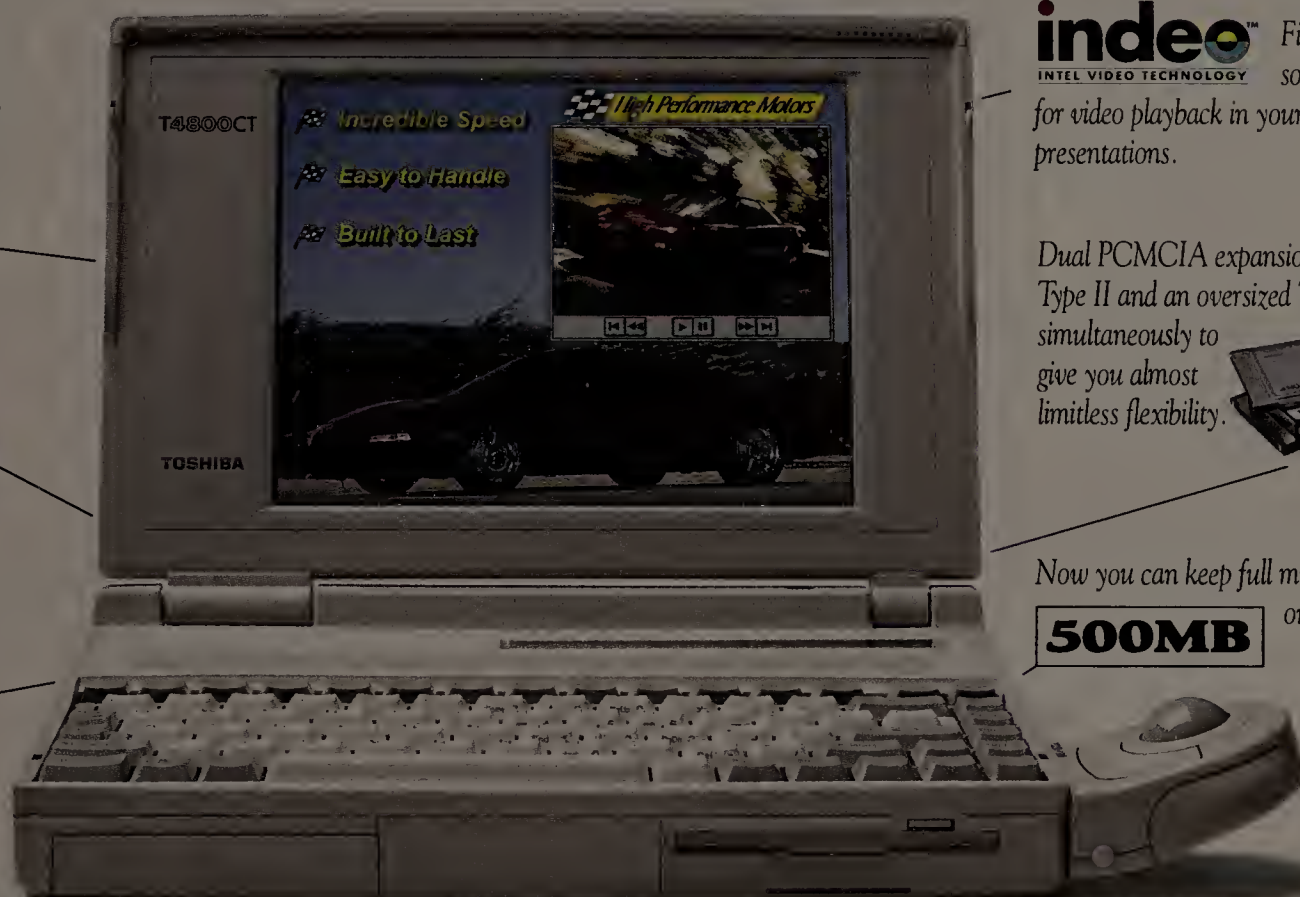
Dock in the optional Desk Station IV for instant connection to your monitor, full-size keyboard, printer, and network.



The integrated sound system—microphone and speaker—plus ports for external microphone, headphones, or speakers, let you record and present loud and clear.



The T-Plan service program provides bumper-to-bumper protection for years to come.



**indeo™** INTEL VIDEO TECHNOLOGY Fire-up the new software standard for video playback in your multimedia presentations.

Dual PCMCIA expansion slots—Type II and an oversized Type III—can run simultaneously to give you almost limitless flexibility.



Now you can keep full multimedia files on your portable.

**500MB**

**INTRODUCING THE T4800CT.** Start portable multimedia computing in high gear. With a 75MHz IntelDX4 processor racing through all your number-crunching and graphics-intensive applications. See your work in 256 simultaneous colors on the vivid TFT-LCD active matrix display. And create the most exciting presentations possible, using full audio capabilities, VL Local-Bus video, and the added thrust of an integrated graphics accelerator. See how it feels.

Call 1-800-457-7777 for the dealer nearest you.

#### T4800CT FEATURES:

- 75MHz IntelDX4™, 3.3 volt processor, 16K cache
- 9.5" dia. color SVGA TFT-LCD active matrix display
- 500MB HDD
- 8MB RAM expandable to 24MB
- Two PCMCIA slots (16mm and 5mm)
- VL Local-Bus video
- Integrated graphics accelerator
- .WAV Audio
- Audio jacks: Headphone/Speaker and Microphone
- 6.9 lbs.
- NiMH battery for extended life
- 3.5" 1.44MB floppy disk drive
- Ballpoint™ Mouse with QuickPort™
- Pre-installed software: DOS, Windows for Workgroups®, Windows Sound System™, Run Time and Video for Windows, and Indeo™ video



In Touch with Tomorrow  
**TOSHIBA**



LOTUS  
NOTES  
READY

# LOTUS ORGANIZER 2.0. BECAUSE WEDNESDAY'S NO GOOD FOR BOB.

There's some kind of cosmic waffle rule that applies to business meetings: if you reschedule once, you will have to reschedule a dozen times. Because if it isn't Bob, it's Joan, or Gayle or Jorgé. And meanwhile, the perceived importance of any meeting is inversely proportional to the number of times it is pushed back. It's been proved.

And that's why there's the new Organizer™ 2.0 with group scheduling. Organizer makes setting up a meeting easy. You choose your attendees from a point and click list. You see their availability. Once you've selected a time and location and posted



your invitation, Organizer makes it easy for your invitees to accept, decline or send a delegate. Organizer works in conjunction with cc:Mail™ or Notes®, for users in workgroups or across entire organizations.

Of course, Organizer is famous as a personal information manager—and now it goes a step further, adding group scheduling that's easy to install, use and support. Check out the new Organizer. For a free copy of our helpful booklet, *Managing Meeting Mania*, or for more information, call **1-800-872-3387, ext. A618\***

**Lotus**

Working Together

*O r g a n i z e r 2 . 0 w i t h G r o u p S c h e d u l i n g .*

\*In Canada call 1-800-GO-LOTUS ©1995 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved  
Lotus, Lotus Notes and Working Together are registered trademarks and Organizer, cc:Mail and NotesReady are trademarks of Lotus Development Corporation.





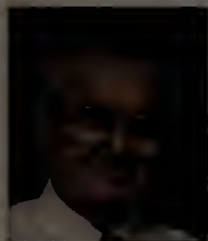






Milan Moravec

## Untangling performance management



To be competitive these days, organizations have to make sure all employees learn and contribute at their utmost. Performance management reviews and appraisals should be geared to this result. But too often they operate on yesterday's assumptions.

Here are some outdated paradigms that must be discarded:

- Performance management should be designed, as the name suggests, to support managers.

If you believe this, your management is probably a roadblock to performance. The most useful performance management process supports work relationships between employees and supervisors. Both parties need to address the question of how best to serve the company's mission, vision, values and customers — together. Results are powered by partnerships.

- Performance evaluation is a management skill.

Supervisors are not necessarily the best qualified to assess their staff's performance. In fact, they may have a very limited or biased view. A more complete picture results if employees and supervisors seek feedback from a variety of customers, colleagues, team leaders and others inside and outside the firm. To do this, they must decide who should collect this information, and how. Ideally, performance management involves 360-degree feedback. Supervisors can then benefit from employees' observations about how the unit is being managed. Teams should also periodically review their own performance as a group and the interpersonal dynamics within the team.

- Performance discussions have to include judgment: pronouncements and assessments from a "higher authority."

Judgment produces compliant employees — people who expect to be told what to do — not innovative ones. Employees dread performance reviews because most of them are conducted in a parent-child, faultfinding context. When sessions are used to support the organization's status quo, they veer toward the "gotcha" and sometimes get stuck there. How much better to simply ask, "What did we learn from this? What can both of us do to improve the outcome next time?"

- The supervisor is responsible for obtaining input from the employee.

Empowered employees can't assume a passive role in performance management, providing self-assess-

ments and other information only on request. They must take the initiative, soliciting feedback from their supervisors and others. And they should do it continuously, as a function of the work that's going on, not just for a formal performance review. They should seek learning opportunities and request help when a goal isn't being achieved rather than attempt to cover up inadequacies. No risk taking and no learning means no improvement. No improvement means abdicating responsibility.

Supervisors should be trained in performance management, then prepare their employees for the process.

If performance management is to be a productive partnership, with empowered employees taking an active role and both parties committed to exchanging knowledge and ideas, supervisors and employees need to be trained together.

Simultaneous training ensures that everyone operates with the same information and expectations. Customers of the process, particularly internal ones, can be included. They can even help design the performance management process.

Learning organizations are not served by the old, top-down ways of managing performance. When employees and supervisors know how to assume responsibility, set objectives together and challenge paradigms in a spirit of positive alliance, learning and competitiveness rise simultaneously.

Moravec is president of Moravec and Associates in Walnut Creek, Calif.

**If performance management is to be a productive partnership, with employees taking an active role and both parties committed to exchanging knowledge and ideas, supervisors and employees need to be trained together.**

## Executive

### Track



**W. R. Grace & Co.** in Boca Raton, Fla., has announced the appointment of **Stephen E. Karinshak**, 51, as corporate vice president and chief information officer.

He will be responsible for implementing the company's global strategic plan for information services by aligning and further developing information technology throughout the company. Prior to the appointment, Karinshak was vice president of finance and administration at Grace Packaging's Cryovac unit. He previously held positions in the Cryovac unit as chief financial officer, director of marketing and director of MIS.

**Duke Power Co.** in Charlotte, N.C., has announced the appointment of **Cecil Smith** as vice president of information technology services and CIO. He will be responsible for the utility's strategic, technological and organizational functions as well as the information technology unit's infrastructure. Prior to the appointment, Smith was executive vice president of information services at Wachovia Operational Services Corp. in Winston-Salem, N.C.

**American Management Systems, Inc.** in Fairfax, Va., has announced the appointment of **H. Eric Firdman** as senior consultant of strategic information sys-



tems in the Mobile Communications Industry practice. Firdman reports to Ed McCabe, vice president of the Mobile Communications group. Firdman

will direct business process re-engineering and strategic consulting service efforts. Prior to the appointment, he was director of new IS technologies at Pacific Bell in San Ramon, Calif.

**Bank of America National Trust & Savings Association** in San Francisco has announced the appointment of **Tsvi Gal** as senior vice president of IS. Prior to the appointment, he was vice president of IS at Wells Fargo Bank in San Francisco.

**BMG Entertainment (Bertelmann Music Group)** in New York has announced the appointment of **J. Scott Dinsdale** as vice president and CIO. His responsibilities will include the development, operations and overall direction of IS. Prior to the appointment, Dinsdale was vice president of applied technologies at Merrill, Lynch, Pierce, Fenner and Smith.

**John Hancock Financial Services** in Boston has announced the appointment of **Charles G. Rayburn** as vice president of retail information services. He reports to Senior Vice President Rob Marra in retail service and systems. Prior to the appointment, Rayburn was director of information technology at PepsiCo, Inc. in Purchase, N.Y. He has held positions in IS management at General Cinema Corp. in Parsippany, N.J., Deloitte & Touche in

Boston, Noranda, Inc. in Toronto and Hoffman-Laroche Ltd.

**The Healthcare Information and Management Systems Society (HIMSS)** in Chicago has announced several recent appointments among its membership. **Richard D. Lang** has been appointed vice president of integration services at **Hartford Hospital** in Hartford, Conn. He was formerly manager of data processing at St. Francis Medical Center in Trenton, N.J.

**Dennis P. L'Heureux** has been appointed CIO at **Rockford Health System** in Rockford, Ill. He was formerly principal at IR Consulting in Woonsocket, R.I., and president of HIMSS. **Mychelle M. Mowry** has been appointed to the medical staff of **HealthOne** in Englewood, Colo. She was previously director of nursing information systems at Cedars-Sinai Medical Center in Los Angeles.

**David G. Selman** has been appointed vice president of information services and CIO at **The Toledo Hospital** in Toledo, Ohio. He was previously director of information and networking services at the University of Michigan Medical Center in Ann Arbor, Mich. And **Judith N. Wells** has been appointed vice president of information services at **RWJ Health Care Corp.** in Hamilton, N.J. She was director of information services and communications at Germantown Hospital and Medical Center in Philadelphia.

**Konica Business Machines U.S.A., Inc.** in Windsor, Conn., has announced the promotion of **Arthur Fino** from IS manager to director of information services technology. Fino will be responsible for computer technical support, applica-

tions programming, computer operations and IS strategic planning. He reports to John Heagney, executive vice president of corporate planning and marketing.

**Gannett New Media**, a division of Gannett Co., has announced the appointment of **John Palm**, 56, as president. He succeeds Thomas J. Farrell, who resigned from the media division last month to face charges of insider trading. Palm was formerly vice president of systems at Gannett Co. in Arlington, Va. **Mark Morneau**, 43, has been named to succeed Palm, with responsibility for Gannett's corporate IS department. Morneau had been vice president of systems and programming at Gannett.

**Lincoln National Life Insurance Co.** in Fort Wayne, Ind., has announced the appointment of **Michael L. Wright** as senior vice president and CIO. He succeeds **Robert K. Malik**, who resigned last December. Wright will be responsible for information technology, business systems development, data center operations and software acquisition.

**Militope Group, Inc.** in Montgomery, Ala., has announced the promotion of **Edward F. Crowell** to vice president of human resources and administration. He will also oversee the computer and peripherals manufacturer's IS operations.

**SNET**, a telecom services vendor in New Haven, Conn., has announced the appointment of **Richard LeFave** as vice president and CIO. LeFave had been CIO at American Express Co.'s Thomas Cook Travel unit in Cambridge, Mass.



# Calendar

## MARCH 19-25

**Object World.** Boston, March 19-23 — Contact: IDG World Expo, Framingham, Mass. (508) 879-6700.

**Life Office Management Association Systems Forum and Exhibit 1995.** Orlando, Fla., March 19-

22 — Life insurance industry conference featuring more than 800 management and technical sessions in areas such as data security, client/server technology and LANs. Contact: Guide International, Chicago, Ill. (312) 245-1599.

**National Fiduciary and Securities Operations Conference.** Orlando, Fla., March 19-22 — Features

30 concurrent sessions divided into five categories: management, securities, products and services, technology and global custody. Contact: American Bankers Association, Washington, D.C. (202) 663-5000.

**FOSE '95: America's Integrated Information Technology Exposition.** Washington, March 20-23 — Contact: Reed Exhibition Co., Silver Spring, Md. (800) 791-3673.

**PCB Design Conference.** Santa Clara, Calif.,

March 20-24 — Focuses on emerging technologies used to design and manufacture printed circuit boards. Contact: Yolanda White, Miller Freeman, Inc., San Francisco, Calif. (415) 905-2354.

**The Business Side of Software and Technology Licensing.** Atlanta, March 23-34. Will also be held April 20-21 in Chicago and June 8-9 in Washington — Fee is \$1,375; member discount price is \$1,195. Contact: American Management Association, Saranac Lake, N.Y. (800) 262-9699.

## MARCH 26-APRIL 1

**The Sixth Annual Commercial Lending Executive Conference.** Irving, Texas, March 26-28 — Theme: "Banking on Change: Tomorrow's Bank, Today's Leaders." Contact: BancA/Andersen Consulting, Dallas, Texas (214) 761-8127.

**National Automated Clearing House Association 1995: Electronic Payments, Business Solutions.** New Orleans, March 26-29 — Focuses on radical changes in the way corporations, consumers, governments and financial institutions exchange information and payments. Contact: National Automated Clearing House Association, Herndon, Va. (703) 742-9190.

**The Natural Conference.** Boston, March 26-29 — Topics include event-driven programming, graphical user interface design, object-oriented programming and design and programming techniques in the client/server environment. Contact: Jim Wisdom, The Natural Conference Committee, Boston, Mass. (617) 342-3660.

**Financial Executives Institute's Information Management Issues Conference.** San Jose, Calif., March 27-28 — Contact: Laura Zepp, Financial Executives Institute, Morristown, N.J. (201) 898-4629.

**Networld/Interop '95.** Las Vegas, March 27-31 — Topics include enterprise applications, networking management, practical LANs, network connectivity, practical Internet and switched networks. Admission is free. Contact: Softbank Expos Conference Co., Foster City, Calif. (800) 488-2883.

**Automated Manufacturing Exhibition and Conference.** Greenville, S.C., March 28-30 — Contact: South Carolina State Board for Technical and Comprehensive Education, Columbia, S.C. (803) 737-9355.

**Advanced Manufacturing Technology Conference.** Cleveland, March 29 — Sponsored by Advanced Manufacturing Research, Inc., Boston, Mass. (617) 542-6600.

**Protecting Your Information Assets.** New York, March 29-30 — Topics include detection and prevention of network viruses. Contact: Jerry Fireman, Inc., Birmingham, Mich. (810) 540-5610.

## APRIL 2-8

**Data Warehouse & Decision Support Systems '95.** Rockville, Md., Arlington, Va., April 3-6 — Sponsored by Barnett Data Systems. Fees: one or two attendees is \$1,295 per person; three to nine attendees is \$1,000; 10 or more is \$900. The exposition costs \$25 per person. Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

# What's Next.

## Two World-Class Events. The Next Generation of Information Technology.

Business advantage through information technology — it's what the world of corporate computing is looking for. This spring in Atlanta, you'll find over 1,000 exhibiting companies from around the world showcasing the next generation of IT — from Windows® 95 to client-server to personal communications to enterprise and global connectivity. Plus the most comprehensive educational conference in the world of technology.

### ON-LINE REGISTRATION.

Go on-line today to register or for the latest information on exhibiting companies, conference speakers and more!  
Internet: World Wide Web URL: <http://www.comdex.com:8000> • Gopher Server: <gopher://gopher.comdex.com:8001>  
E-mail: [info@comdex.com](mailto:info@comdex.com) • Ziff-Net/CompuServe: Type GO TO COMDEX • OR REGISTER BY FAX! Call 617-449-5554, enter Code 22, and have your fax number ready — we'll fax your registration form within 24 hours!

**COMDEX/Spring '95**  
The World's #1 Information Technology Marketplace for Resellers and Corporate Decision Makers

**WINDOWS WORLD '95**  
The Official Conference and Exposition for Windows Computing

**APRIL 24-27, 1995 • GEORGIA WORLD CONGRESS CENTER • ATLANTA, GEORGIA USA**

©1995 The Interface Group • 300 First Avenue, Needham, MA 02194-2722 USA • (617) 449-6600

WINDOWS WORLD and the Windows logo are trademarks of Microsoft Corporation. WINDOWS WORLD and the Windows logo are used by Interface under license from Microsoft. SP6598



# INTRODUCING PCANYWHERE ACCESS SERVER. NOW YOU CAN SET UP YOUR REMOTE USERS WITHOUT EVER LEAVING YOUR DESK.



Now, the easiest-to-use remote access software is easier than ever for you to set up and install. Thanks to the new Norton pcANYWHERE Access Server.™

With Norton pcANYWHERE Access Server, you can configure all of your Norton pcANYWHERE™ Windows or DOS (4.5 or higher) users from one location. Your very own desktop.

Norton pcANYWHERE Access Server provides simultaneous remote sessions for as many as eight Norton pcANYWHERE users at one time on one server.

Which means you've just eliminated the necessity of having individual desktop hosts. And that means you can reap the full benefits of every dollar you have already invested in modems and telephone lines.



*The Peter Norton Group brings centralized management to remote computing with Norton pcANYWHERE Access Server.*

You can install Norton pcANYWHERE Access Server with just one disk in about fifteen minutes. You can even pre-configure user software to simplify communications with the server.

If you are a NetWare user, Norton pcANYWHERE Access Server will interact directly with the bindery, allowing you rapid access to user information.

## A REMOTE SOLUTION THAT'S EASY TO USE.

Thanks to Norton Assistant, a graphical user interface and online help Cue Cards, Norton pcANYWHERE 2.0 is just as easy for your users to get up and running as it is for you to set up and configure.

Norton pcANYWHERE 2.0 requires no modification of Windows system or INI files, so your users have unmatched compatibility with all their favorite Windows applications.

A built-in File Manager automatically synchronizes user files and directories between remote and office PCs.

Virtual device drivers replace TSRs, freeing memory space and simplifying memory management.

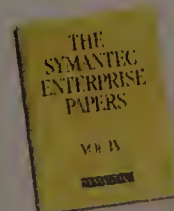
And remote drive mapping allows your users to work with files on their remote PCs without the hassle and delay of waiting for data transfers.

Make the right strategic move. Find out more about Norton pcANYWHERE Access Server and Norton pcANYWHERE 2.0 today. It's the winning remote solution.

**CALL 1-800-453-1135.**

Ask for Ext. 9B49 for more information and request our White Paper, Remote Access Computing in an Enterprise Network.

White Paper available in U.S. only. For more information in Canada, call 1-800-667-8061. In Australia, call 2-879-6577.



**SYMANTEC.®**  
**MANAGING THE ENTERPRISE.**



Everyone  
is getting  
recognition  
using your  
killer custom app.  
Isn't it time  
you got some  
of your  
own?

*Announcing the First Annual Apple Enterprise Awards  
Call 1-800-396-6877 for an entry kit*

## *Call for Entries*

Apple Computer has always been committed to providing people with power. The power to be your best.<sup>®</sup> That is why Apple, in association with *Computerworld*, will pay tribute to developers whose ideas and software have helped others perform at their very best.

Developers like you, for instance.

Because of your work, companies and institutions have increased efficiency and productivity. They have been able to accomplish things that were never possible before. And we feel it is high time your accomplishments were recognized by an award of your very own. Therefore, it's our pleasure to announce the first annual Apple Enterprise Awards.<sup>SM</sup>

The Apple Enterprise Awards is a global competition designed to honor developers of innovative custom solutions that best employ Apple<sup>®</sup> technologies. Your submission will be judged on how you've delivered an effective custom solution in your organization.

Winners will be announced at an awards ceremony during PC Expo in New York, June 19-22, 1995. Winning solutions will be displayed in the Apple Enterprise Awards booth at the show, and featured in a special supplement in *Computerworld*.

So call 1-800-396-6877 today to receive your entry kit. The deadline for entries is **April 3, 1995**. Hurry, because it's not every day that you get a chance to be recognized.



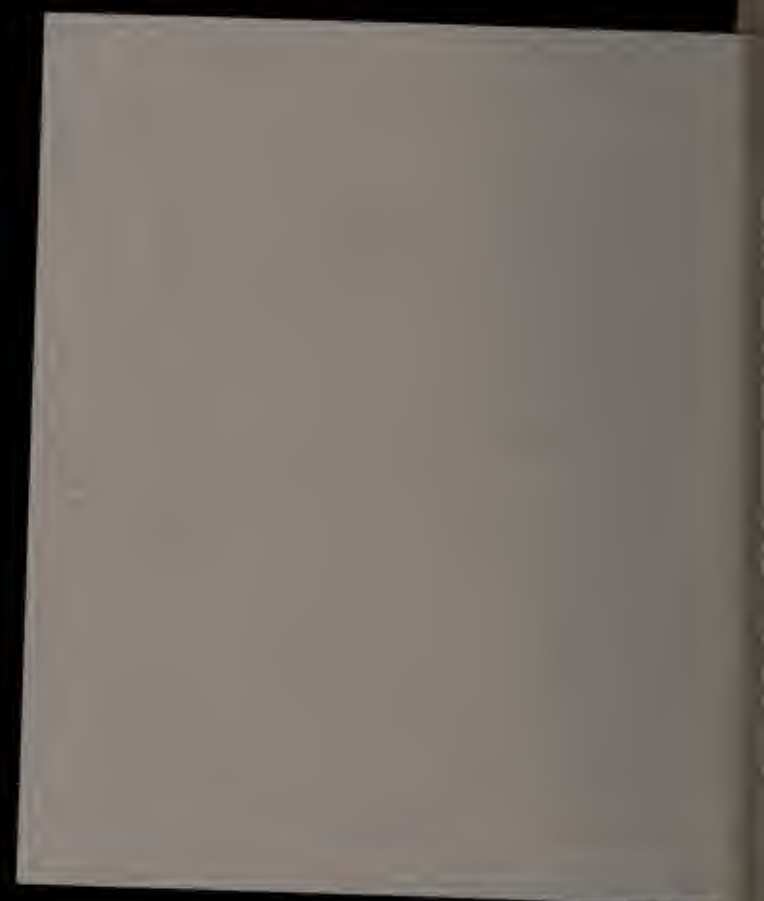
**Apple Enterprise Awards**  
Computerworld's Corporate Application Contest

The official entry kit contains all details and rules for this contest. Void where prohibited by law. No purchase necessary. Computerworld, Inc. is an IDC company. © 1995 Apple Computer, Inc. All rights reserved. Apple, the Apple logo and "The power to be your best" are registered trademarks of Apple Computer, Inc. Apple Enterprise Awards is a service mark of Apple Computer, Inc.











## *Miss Manners'* *Guide to Excruciatingly Correct* *Internet Behavior*

BY VIRGINIA SHEA

Judith Martin (a.k.a. Miss Manners) schools gentle 'net surfers  
on how to act properly on-line

**Q** NE NEVER PLANS to be a manners guru. But thanks to the work of Judith Martin — better known as Miss Manners — I wasn't a complete etiquette ignoramus when I started writing my book, *Netiquette* (Albion Books, 1994). I've been reading Miss Manners' syndicated column since she started writing it in 1978.

Miss Manners has commented extensively on how to behave correctly in almost every situation in American life. So why not in cyberspace? When the opportunity to interview her came up, I decided to ask her what she thought about a few of the on-line world's more irksome conflicts. Here's what she had to say:

**Virginia Shea:** Let's start with a business scenario: I'm working on a project for upper management, and I E-mail a fairly urgent request for information to a middle manager. She doesn't respond. Later in the day, I run into her in the hallway, and she says, "Oh, I had about 20 E-mail messages this morning, so I didn't read any of them." Her implication is that E-mail is a technological annoyance that she can ignore. I think that if she's not reading her E-mail, she's not doing her job. Who's right?

**Miss Manners:** E-mail is something [that falls] between the telephone and snail mail, which is what makes it so very useful. If you define E-mail as something you must read and answer immediately, then basically you've reinvented the telephone. The telephone is useful because it interrupts people, and it's a nuisance because it interrupts people.

In thinking about precedence in business, someone who is standing in front of you comes first, the telephone second, E-mail third and letters or faxes are fourth.

However, if you are in a business in which most of your work is done by E-mail, and everybody agrees that it's a priority, that's something else. Any company can make its own internal rules about when to tend to things.

**Shea:** Because E-mail can go essentially from the writer's brain to the recipient's screen, people often press the "send" button on messages they probably wouldn't put in the mail. So here's the situation: A colleague sends me E-mail saying that he doesn't like some work I've done, and he says some rather nasty things. Of course, my immediate response is to want to flame right back at him. Is that a good response?



PHOTO ILLUSTRATION OF JUDITH MARTIN BY LARRY GOODE/DESIGN ISLAND

**Miss Manners' overriding rule of all of etiquette: 'Behave yourself!'**

**Miss Manners:** The etiquette rule is that you do not respond to rudeness with more rudeness; it doesn't solve the problem. So you treat him with the proper reaction to rudeness, which is not to [act as if] everything is fine. You get rather stiffly polite, and you steer somewhat clear of that person until he realizes he's done something awfully wrong.

**Shea:** Most employees feel their E-mail should be private. But some employers argue that, because they own the computers, they have the right to monitor E-mail. Who is right?

**Miss Manners:** Are we talking about company time? They shouldn't be making personal phone calls on company time, either.

I think the real answer to the question is that anybody who *assumes* that E-mail is private, even in a company that does not monitor it, is a

Miss Manners, page 87



# Two Strategies for Client/Server Applications Development

## Both in One Software...the SAS® System

Only the world's leading information delivery system gives you two proven strategies for satisfying today's client/server applications development needs:

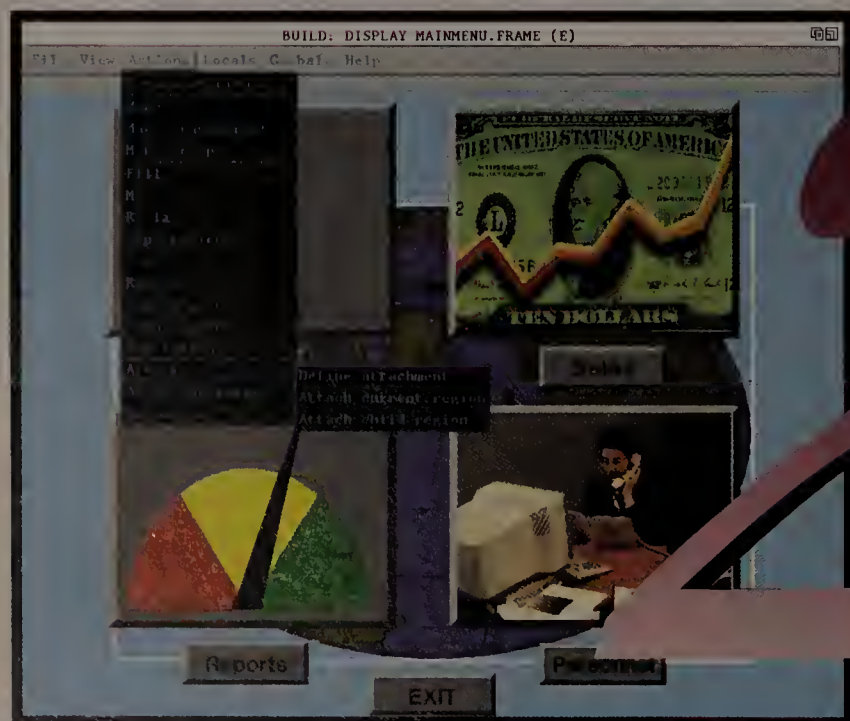
### Empower Your User Community

**1** The SAS System offers a secure and manageable environment for making enterprise data available on demand. And for turning that data into useful business information for strategic decision making.

Through an intuitive, dynamic, and data-driven interface, even novice business users can handle the most sophisticated requests by themselves: ad hoc queries, reports, business graphs, forecasts, analyses, and more. By making the SAS System your standard for end user access and reporting, you'll empower users to satisfy their own information requests.



### Empower Your Applications Developers



**2** With more self-reliant end users, developers are free to concentrate on implementing client/server applications critical to your business. Here, too, the SAS System satisfies your most demanding requirements by supporting an *iterative* approach to rapid applications development. Put strategic business systems in production quickly... even as you continue to develop and enhance them.

Object-oriented tools simplify and speed development. And support for multiple client/server models (including distributing application logic to the processor best equipped for the task) provides a flexibility unrivaled by "client only" development tools. What's more, the SAS System's portable architecture means applications look and run the same no matter where you deploy them, desktop to data center, preserving your applications investment over the long haul.

### Take a Minute Now to Take Years Off Your Development Cycles

With the SAS System, you'll improve business processes rather than just automating them. Users become more independent, developers more productive, and applications more valuable...today and tomorrow. For a closer look at the SAS System—and to find out how to receive these applications development tools for a free evaluation—just give us a call at **919-677-8200**.



SAS Institute Inc.  
Sales and Marketing Division  
Phone 919-677-8200 ☐ Fax 919-677-8123  
In Canada: Phone 1-800-363-8397

SAS is a registered trademark of SAS Institute Inc. Copyright © 1994 by SAS Institute Inc.



## Miss Manners

CONTINUED FROM PAGE 85

fool. E-mail should be regarded in the nature of, say, a postcard. Nobody's supposed to read your postcards, but I wouldn't write my secrets on one.

**Shea:** Are there business interactions that absolutely should not be handled by E-mail?

**Miss Manners:** I wouldn't fire someone by E-mail, or hire someone by E-mail, or quit or ask for a raise, for several reasons — among them privacy and the nuances of human interaction.

**Shea:** Last year, a husband-and-wife team of immigration lawyers posted an ad to Usenet. They didn't just post it to a few groups; they "spammed" it — sent it to thousands of Usenet newsgroups. This broke two major rules of 'netiquette: first, that you don't advertise on Usenet, and second, that you post within the subject matter of the newsgroup.

So whose crime was worse: the lawyers' or [that of] the people who flamed them, mail-bombed them or sent them death threats?

**Miss Manners:** [Laughs] That doesn't give me much to choose from! What [the lawyers] did is the equivalent of my coming to a party at your house and going around to everyone trying to drum up business. It's excessively rude. Now, sending death threats is not exactly charming either, is it?

But let's just talk about the flaming. Should [the newsgroup users] have driven those people off of their boards? Yes. Should they have done it rudely? No.

**Shea:** The problem is that it's very hard to drive somebody off a newsgroup if they don't object to negative feedback. Is there anything you can do in that kind of situation?

**Miss Manners:** You mean the death threats aren't working either?

**Shea:** Even the death threats didn't work. These two lawyers have now published a book in which they say that only starry-eyed idealists believe there's a community in cyberspace and that individuals have no obligation to follow the customs of cyberspace. Basically, they deny that there is such a thing as etiquette on-line. Is there any polite response to that?

**Miss Manners:** The response is the same as it is in society: You can deny all you want that there is etiquette, and a lot of people do in everyday life. But if you behave in a way that offends the people you're trying to deal with, they will stop dealing with you. And that can happen as easily in cyberspace as it happens every day in real life.

There are plenty of people who say, "We don't care about etiquette, but we can't stand the way so-and-so behaves, and we don't want him around!" Etiquette doesn't have the great sanctions that the law has. But the main sanction we do have is in not dealing with these people and isolating them because their behavior is unbearable.

[In cyberspace], people can easily avail themselves of the cloak of total anonymity, which of course creates a lot of etiquette problems. Because if you're rude under a code name and I can't see you, I don't know where you live, and I don't even know your real name, [then] you probably don't feel the sense of shame you would feel if you were rude to the same group of people but were in a room with them.

**Shea:** Some people use the anonymity of cyberspace as an opportunity to try out new, alternative identities. One thing that's fairly common is gender switching, especially in flirting or sex-talk areas. Is this correct behavior under any circumstances? Under some circumstances?

**Miss Manners:** It's a "consenting adults" thing. If you have a forum where it's understood that everybody gets to play out a fantasy and be whom they like, why not?

What gets tragic is if you have people who are presuming that meeting people in cyberspace is the equivalent of meeting someone through a social circle where they are known and start putting trust in the people they meet.

**Shea:** Do you have a sense about the general state of on-line etiquette as compared to "real world" etiquette — better, worse or just different?

**Miss Manners:** I think you have the two extremes. I know a lot of people who very much enjoy various forms of participation [in cyberspace] and make extra efforts to see that it's enjoyable for everyone. And then there are the kind of people you've described to me today. In that sense, you've got all the ingredients you have in the real world.

**Shea:** Do you think there's one overriding "golden rule" of 'netiquette?

**Miss Manners:** Behave yourself! That's the only overriding rule of all of etiquette, which by its very nature is composed of specific rules for specific situations. What you're asking is whether there's an underlying moral concept. And there is — don't scare the horses on the streets.

I always presume, because it helps me get up in the morning, that most people are people of goodwill and would like to restrain themselves from offending people if they knew what was offensive.

**Shea:** I find that most people do want to get along with other people, and that in fact, many people are probably nicer on-line than they are in real life.

**Miss Manners:** Really! Nicer!

**Shea:** I think in some cases, yes, because there's no obligation to go on-line when you're feeling bad. I suspect some people are showing the best side of themselves when they're on-line, whereas maybe they can't be as effective at hiding their bad side in their everyday lives.

You know, it's fun to talk about the crazy people who make life miserable, but I really believe that most people want to be at least reasonably nice. I mean, the whole existence of newsgroups — people go way out of their way for others they don't even know, just because they have a common interest. It's a wonderful kind of sharing.

**Miss Manners:** The people I know who participate [in newsgroups] have been delighted because they feel there's real conversation there. But then you began to scare me with the number of outlaws that you mentioned.

You know, I have this hope that [the 'net] is going to revive the arts of conversation and letter-writing. Because suddenly people who used the phone only to communicate are writing out their thoughts and feelings. In real life, conversation has turned so much into whining and polemics. I would think that would get tedious very quickly in a cyberspace group, where it is your ability to be interesting that's valued. So maybe it will teach people again how to talk and write. Wouldn't that be wonderful? ■



LARRY GOODE/DESIGN ISLAND

## Express yourself :-)

The fact that most network interactions are limited to written words can be the source of misunderstandings. Fortunately, clever network users have had years to deal with this and have created a shorthand to communicate the tone of their correspondence, a tone they would otherwise convey by voice, facial expression and/or gesture. These shorthand expressions are known as "smileys" or "emoticons." Smileys are easy to figure out once you get the hang of them (just remember that they always face sideways).

:-) Smile; laugh; "I'm joking"

:-( Frown; sadness; "bummer"

;-) Wink; denotes a pun or sly joke

:-O Yelling or screaming; completely shocked

:-() Can't or won't stop talking

:-D Big, delighted grin

:-P Sticking out your tongue

:-] Sarcastic smile

%- ) Confused but happy; drunk or under the influence of controlled substances

%-( Confused and unhappy

:'- ( Crying

:'-) Crying happy tears

:-\ Mixed feelings but mostly happy

:-/ Mixed feelings but mostly sad

\* Kiss

{ } Hug

{ { { \*\*\* } } } Hugs and kisses

— From the book *Netiquette* by Virginia Shea (Albion Books, 1994; info@albion.com or (415) 752-7666).



# IF THE THOUGHT *of a* ROOM FULL *of the* LEADING ENTERPRISE COMPUTING EXPERTS EXCITES YOU, MAYBE YOU NEED *a* DAY OFF.

Start by signing up for:  
**"Practical Computing For The  
Changing Enterprise"**

**Get up to speed  
on the informa-  
tion superhigh-  
way.** Visit the  
Internet Center in the  
Exhibit Hall, where  
you can receive  
hands-on instruction  
to help you explore  
the Internet on a  
Sun SPARC Voyager.  
Learn about setting  
up a Worldwide Web  
server, creating a  
multimedia home  
page, and more.

**Hear the enterprise  
experts.** The keynote speakers  
at the conference will include inter-  
national business consultant Kelsey  
Tyson, plus George Weiss, Vice  
President and Research Director  
of the Gartner Group.

**Here's your chance to spend an entire day with the leading software developers  
and systems integrators in open, client-server computing.** It all takes place at this  
unique educational conference, sponsored by Computerworld and Sun Microsystems. You can  
choose from a series of presentations, each designed to give you up-to-date, practical informa-  
tion to help your company meet today's enterprise computing challenges. There are even three  
workshops created just for this conference, "Managing the Winds of Change", "Horizontal  
Thinking in Vertical Organizations" and "The Enterprise Client: Its Time Has Come".

## Where? And When?

Santa Clara Convention Center (Seattle) Washington State	March 16
Convention Center	March 24
Phoenix Civic Plaza	April 5
Pasadena Convention Center	April 11
(Portland) Oregon Convention Center	April 18
San Diego Concourse	April 26

**Get on the right track.** Choose from the fol-  
lowing six course tracks, featuring presentations,  
case studies, and technical workshops by 20 lead-  
ing software developers and members of Sun's IS  
staff. (\$95 advance fee or \$125 at the door)

**Executive:** This  
track is limited to  
CIOs and CFOs  
who want a high-  
level overview of  
key enterprise solu-  
tions implemented  
by our executive  
partners and their  
systems integrators.

**Financials:** This  
provides a case  
study overview of  
leading financial  
applications devel-  
oped by leading  
companies.

**Applications  
Development:**  
This highly technical  
track focuses on  
object oriented and  
traditional CASE  
environments, with  
a special workshop  
on developing par-  
allel applications.

**Enterprise  
Applications  
and Workflow:**  
This provides an  
overview of appli-  
cations used for  
enterprise-wide pro-  
ductivity with  
emphasis on main-  
frame applications.

**Systems  
Management:**  
A discussion of a  
wide variety of sys-  
tems management  
tools, along with  
technical tips for  
improving the pro-  
ductivity of your  
system.

**Network  
Management:**  
This focuses on the  
effective use of net-  
work management  
tools, with a work-  
shop on security  
and the Internet.

This coupon good for

*One  
free  
admission*

to exhibits only.

## Go Ahead.

**Take a day off.** For a detailed  
agenda or to reserve your space, call  
1-800-593-2252, or find out more about  
the conference on the Internet at  
[http://www.sun.com/events/  
naafo/west/pcce/](http://www.sun.com/events/naafo/west/pcce/)

**COMPUTERWORLD**



**Executive sponsors:** Informix Software, Inc.; Oracle Corporation; Sybase, Inc. **Partners:** AIM Technology; Amdahl Corporation; American Power; CenterLine Software, Inc.; Computer Associates; Computron Technologies Corporation; General Microsystems; Information Builders, Inc.; Legent Corporation; Lotus Development Corporation; Object Design; Peoplesoft; Progress Software Corporation; SAP; SAS Institute; SunSoft; Thompson Software Products; Xsoft. **System Integrators:** Cambridge Technology Partners; Price Waterhouse; Andersen Consulting.



# Here's where I.S. professionals will see one hundred workplaces considered the best



## And that makes it the perfect place to advertise what's best about yours

I.S. professionals want, and need, to know the best places to work in I.S. Which is exactly why Computerworld will again publish its annual Best Places to Work magazine in June.

You won't want to miss your place. Because this comprehensive look at which employers are best -- and why -- is the only workplace magazine of its kind. Specifically, it will examine workplace issues ranging from salary levels, to benefit programs, to promotional opportunities, to workforce diversity, to communication processes, to the use of current technology. With equal weight given to each of these factors.

And all of this means, this is your once-a-year opportunity to broadcast the qualities of your I.S. workplace with your image recruitment advertisement.

Computerworld's Best Places to Work magazine. It's where I.S. professionals will see the best workplaces. And where you can make sure they see yours.

### ISSUES AND CLOSING DATES

- Issue date                      June 1995
- Advertising close              May 3, 1995
- Materials close                May 16, 1995



PUBLISHED BY

**COMPUTERWORLD**  
The newspaper of I.S. since 1967

**For more information, or to place your advertisement, call 1-800-343-6474, ext. 201**



# Computer Careers

## Crash course in 'net security

By Alan Radding

Crime may indeed pay if you're thinking about a career in Internet security. But for now, responsibility for security is falling through the cracks.

Every now and then, however, a stunning breach propels Internet security into the limelight. The most recent breach occurred Christmas day when a hacker scaled significant security hurdles to break in to a computer at the San Diego Supercomputer Center. The attacker slipped past a firewall by disguising his identity through a form of spoofing called sequence number attack. He made himself appear to the firewall as a trusted machine.

Until this breach, firewalls, which are merely a set of filters, were considered to be virtually fail-safe protection. But since 1985, Internet security experts have known of the particular weakness exploited by the attacker. Since the Christmas raid, the reassurance firewalls once provided has been shattered.

From a security standpoint, the Internet falls short in two of the following three critical security dimensions: confidentiality, integrity and availability. Availability is easy. "The Internet gives

you so many paths to where you want to go that availability is never a problem," says John O'Leary, director of education at the Computer Security Institute in San Francisco. However, ensuring confidentiality and integrity present seemingly insurmountable obstacles.

Still, those responsible for security aren't helpless. If you want to take on the challenge, you'll need to hone skills in firewalls and cryptographic technology, which includes encryption.

Firewalls, usually as part of a router, screen incoming and outgoing messages. They inspect the messages down to the packet level and can be set to pass or reject messages on the basis of user identification, point of origin, file and other code or actions. Even though firewalls have proved vulnerable, information systems staff must "become knowledgeable with the hardware and software of firewalls," says Kurt Stammberger, a spokesman for RSA Data Security, Inc., a data encryption vendor in Redwood City, Calif.

"For inbound traffic, we advise our clients to use two firewalls, and then we think all traffic should go to a mailbox," says Daniel E. White, a partner at Ernst

Few companies have dedicated staff to Internet security, but continued growth and savvier hackers will increase the need for this expertise



& Young in Chicago. Firewalls can also help control outgoing traffic by preventing sensitive types of files from passing out of the router and onto the Internet. But firewalls are only a perimeter defense. If they are breached, users still need good security on their internal hosts.

Encryption is a must for any organization that wants to conduct business or perform transactions over the Internet.

But before an organization even gets to the point of firewalls and encryption,

it must master the basics of good IS security as well as educate users about the threats lurking on the Internet. "This is pretty basic stuff, but you need to keep reminding people," White says.

Few organizations have someone solely dedicated to Internet security. But a few more high profile attacks such as the Christmas raid, combined with the astounding growth of the Internet, may turn someone with Internet security skills into a hot commodity.

Radding is a freelance writer in Newton, Mass.

### Continuing ed

Internet security is only just coming to the forefront. Security technology vendors provide training in their individual firewall and encryption products but don't address general security. Some discussion is also included as part of programs on Internet connectivity.

The primary clearinghouse for information on Internet security problems is the Computer Emergency Response Team at Carnegie Mellon University's Software Institute in Pittsburgh.

In addition, the Computer Security In-

stitute in San Francisco spends a considerable chunk of its two-day program, called "Network Security: LANs, Client/server and the Internet," on Internet security. The program is scheduled for March 9-10 in Gaithersburg, Md., and March 20-21 in Nashville.

Internet security is also the subject of a program at the Computer Security Institute's upcoming NetSec conference set for June 12-14 in New Orleans and at its 22nd annual conference set for Nov. 5-8 in Washington.

**PRODATA INC.** Portland, OR  
Salt Lake City, UT

As One of the West's premier IS Consulting Service firms,  
We Offer:

- Career Growth • Excellent Compensation • Loaded Perks
- Continuing Education • The Challenge of Diversity
- Fortune 500 Clientele • Outstanding "Quality of Life"
- A Decade of Sustained Growth • Relocation Assistance

#### We Need:

INFORMIX (incl. DBA's), Powerbuilder, Visualbasic, Visual C, Sybase, Oracle Tools, DB2/CICS, Cobol, IDMS/ADSO, HURON, SYNON, LOTUS NOTES, UNIX, IEF/5.3/C/C++/UNIX... also...

"Hands-on" Project Managers w/ proven, formal "Fixed Fee" or "Not to Exceed" responsibilities

#### PRODATA

4800 S.W. Macadam  
Suite 309  
Portland, OR 97201  
(PH) 503 223-3508  
FAX 503 223 7918

#### PRODATA

1100 E. 6600 S.  
Suite 200  
Salt Lake City, UT 84121  
(PH) 801-266-6138  
FAX 801-266-0069

CAREERS IN COMPUTERS

**\$40,000 TO \$65,000**

IBM, AS/400, DEC/VAX,  
COBOL, CICS, IMS DB/DC, RPG,  
C++, SMALLTALK, POWERBUILDER,  
VISUAL BASIC, IEF, SEER, CNE, SYBASE,  
ORACLE, FORMS 4.0, DB2, OMNIS 7,  
OS/2, DB2/6000, UNIX, NOVELL

FOR THESE AND OTHER POSITIONS  
CALL COLLECT OR WRITE

(800) 301-1582

1800 Meidinger Tower  
Louisville, KY 40202

**COMPUTER CAREER  
CONSULTANTS INC.**

500 AFFILIATED OFFICES  
Client Companies Pay Fees



"First When Quality Counts"

### Only at New River!

Consulting and integration companies are springing up all around. All claim to offer unlimited career opportunities. Most claim to be people oriented and some profess industry leadership in the various technologies. At New River Technology we believe in the "put up or shut up principal"! Which is why we have developed and employ our New River Virtual Employee Methodology. Every New River Employee participates in this program to insure that their skills do not become obsolete, they are provided ample opportunity to meet their short and long term career objectives and their Manager/Supervisor is reviewed on their success in helping you in this program. If you would like to discuss the opportunities and our approach at New River and have the following qualifications:

- Object Oriented Technologies (C++, Small Talk, etc)
- UNIX, C, Powerbuilder, Visual Basic, Telephony
- AS400, SYS36, Mainframe, COBOL, CICS, DB2
- Relational Database Experience (INFORMIX, ORACLE, SYBASE DB2, etc)
- Applications Experience (SAP, ORACLE MFG + FINANCIALS, etc)

Please call New River at (919) 233-8845 or fax resume to (919) 233-1340 or mail resume to New River Technology, 1215 Jones Franklin Road, Suite 103, Raleigh, NC 27606.

**NR NEW RIVER  
TECHNOLOGY**

### CONSULTANTS Immediate Interviews

#### MAINFRAME

DB2/CICS • EDI • ADSO  
DB2 or CICS • IDMS • IMS  
Natural 2 • Internals • VM  
Tandem • AS 400 • CASE  
ADW or IEF • CSP • HPS  
BAL • APS • PLI  
HOGAN • QMF • MKTG Reps

#### CLIENT SERVER

Lotus Notes • VAX/RDB • Excel  
Powerbuilder • Informix • Banyan  
OLE 2.0 • Novell • Paradox  
Oracle • Unix • Vis Basic  
Lan/Wan • Sybase • Smalltalk  
Visual C++ • Access • C++  
Sys/Admins • TCP/IP • Motif  
Windows • Testing • MF/Cobol  
Windows NT • SAP • System 10

**RRA** Rohn Rogers Consulting  
1212 6th Ave, 9th Fl, NYC 10036  
800-421-5158 212-921-1319  
Fax 212-302-4363

### CONTRACTORS

#### ALL TECHNICAL SKILLS

#### NATIONWIDE REQUIREMENTS

We mail your resume to brokers nationwide at no cost to you.  
Send your resume to:

**JKL Enterprises, Inc.**  
500 North College, Suite 108  
Charlotte, NC 28202

1377 K Street NW, Suite 167  
Washington, DC 20005  
1-800-257-0945  
(202) 543-1930  
FAX: (202) 543-2230



Despite continued consolidation at automakers, the IS hiring outlook is hopeful

# GETTING INTO GEAR

By Cheryl Gerber

**A**ggressive technical goals planned for the next decade have strengthened the automotive industry's job outlook. For the first time in a long while, companies are poised for hiring.

"The industry is going to get stronger, especially in the product design area," says George Peterson, president of automotive consultancy AutoPacific, Inc. in Santa Ana, Calif. "Those with both mechanical engineering and computer systems skills will be able to write their own ticket with the Big3 in Detroit."

Driving the demand are the recent achievements of top manufacturers. After a dry spell, for example, General Motors Corp. has reportedly steered its car and truck business from a \$10.7 billion loss in 1991 to a \$362 million profit by last fall. Indeed, others are doing the same.

"The Big3 and all the little engineering companies are hiring more now than they were one year ago," says Dan Bortfeld, staffing manager at Electronic Data Systems Corp., a GM subsidiary.

## All need apply

Competition for technical jobs is fierce, however, whether you seek work at a manufacturer, dealer or supplier. Luckily, both specialized and broad backgrounds are in demand.

"There is more demand for CAD/CAM, client/server architecture and desktop applications such as Microsoft Corp.'s Office or Lotus Development Corp.'s

Notes," says Bortfeld, who recruits for EDS accounts that support GM worldwide. "But even the legacy or business application support systems are busy and competitive now."

And things are only going to get more interesting, industry watchers say. In the next few years, systems integration will

**"For the past two years, we've been in an upward economic cycle. We're looking for C programmers, object-oriented database programmers and experts in TCP/IP and Unix workstations."**

Mike Morton, Chrysler Corp.,  
Auburn Hills, Mich.

be the name of the game. To that end, managers will be hiring staff to construct the backbone that will buttress the intelligent vehicle highway systems planned for the future. The integration of speech recognition and geographical information systems using smart chips, for example, will provide motorists with car navigation systems.

Intense competition has also increased the need for ever-improving safety systems and maximum efficiency in design production as well as the demand for networking skills, according to Mike Morton, manager of technical data

management for computer-aided design (CAD) graphics at Chrysler Corp. in Auburn Hills, Mich.

Interest in networking peaked when the Automotive Industry Action Group announced last fall that it would adopt TCP/IP. The decision was expected to increase commercial use of the Internet and help companies that provide TCP/IP-based services.

At about the same time, the American Automobile Association announced it would link the majority of its member clubs via a frame-relay network by the end of last year through a \$100 million contract with AT&T Corp.

## Dealers join in

Eventually, even dealerships are planning to jump on the information superhighway to communicate directly with customers over the Internet, says Ken Barile, MIS manager at BMW of North America, Inc. in Woodcliff Lake, N.J. Meanwhile, Barile says there has been an increased use of electronic data interchange among manufacturers, dealers and suppliers in the past year.

Though slight peaks and valleys in the economy and, subsequently, hiring may occur, analysts are positive. The auto industry will likely remain a solid employment option throughout the decade for multitalented IS professionals. ■

Gerber is a freelance writer in San Francisco.

## THE REAL WORLD

In the heyday of consolidation and plant closings, auto manufacturers learned a hard lesson on the hiring front — the importance of adjusting the hiring rate according to business levels.

While contract hiring has always been popular in the automotive industry, the practice has become more common in the past two years.

"There tends to be more contract than direct hiring now at Chrysler," says Mike Morton, manager of technical data management for CAD graphics at Chrysler.

"In the cyclical trend of the automotive industry, anything above the standard number of staffers during the bottom of the cycle are contracted, so you don't have to hire and fire people every three to four years," he says.

Although Chrysler has been in an upward economic cycle during the past two years, it is downsizing and trying to stabilize head count just like everyone else. "We're not hiring for internal Chrysler positions right now," Morton says.

Contractors are hired for specific projects and periods of time, he adds. If Chrysler does increase full-time staff, it's for a specialized technical area.

"We're looking for C programmers, object-oriented database programmers and experts in TCP/IP and Unix workstations," Morton says.

As for compensation, salaries have stayed pretty much the same in the past year or two, with the exception of cost-of-living raises.

And while more staffers have been coming into Chrysler at a higher rate structure, Morton says he hasn't seen the top of the rate structure move up.

— Cheryl Gerber

## SYNON PROFESSIONALS

**Are You Interested in Advancing Your Career?**

For qualified individuals we offer:

- An outstanding compensation package consisting of a high base salary, paid overtime and bonus based on performance.
- Guaranteed training budget for personal advancement (IT and non-IT).
- Opportunity to learn Obsidian.
- Medical, dental and life insurance coverage.
- Relocation assistance.
- Detailed client performance evaluations to provide for rapid professional advancement.

This is an excellent opportunity for professionals with the right skills and personality.

**DataRich**

Please call DataRich International at (800) 487-7717 or fax resumes to (201) 487-2858.  
**DataRich International**  
a subsidiary of DataRich Management Systems, Ltd.  
23 Polify Road, Hackensack, NJ 07601

We are one of the largest providers of Synon-based consulting services in the US with clients in nearly every major metropolitan city.

Due to increased client demand we are looking to hire candidates possessing a minimum of 2 years Synon experience coupled with strong business and analytical skills.

## ARE YOU MAKING WHAT YOU'RE WORTH?

In only its second year, Computer Systems Authority has grown dramatically because of our innovative compensation structure and quality consultants. Our formula for success is simple:

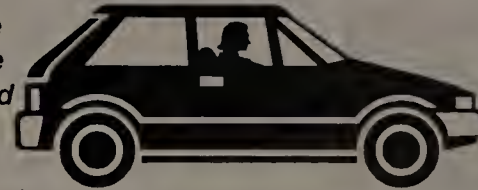
- Attract the best people...
- Provide strong incentives for performance...
- Handle the administrative details...
- Get out of the way...

Constructed on a new business model, CSA is designed to provide you with the partnering support to be successful. The focus is to provide unlimited income opportunities for you by minimizing traditional corporate overhead. Most of your billing rate will come directly to you. Most consultants make in excess of \$100,000/year.

At CSA we are looking for consultants who have an entrepreneurial attitude, a strong work ethic, flexibility, marketable skills and strong principles. Whether you are an employee or work as an independent, you should consider the opportunities available through CSA Consulting. Please fax resumes to 214-247-5047 or e-mail at admin@csac.com

**CSA Computer Systems Authority Consulting**

**To Keep Up With Those Driving in the Fast Lane of Technology, You Need to Position Yourself With A Leader.**



Software Services Corporation is a software development and consulting company specializing in providing our Michigan based clients with the best consulting and project solutions. We have the knowledge and commitment to stay on the cutting edge of technology.

We manage our business through a Total Quality of Service Program whereby each consultant is empowered to understand and anticipate the needs of our clients. This commitment to quality has allowed us to become the first computer consulting firm to achieve a preferred quality status by one of the leaders in the automotive industry.

We have opportunities available for professionals with experience in:

- |                             |                              |
|-----------------------------|------------------------------|
| <b>CLIENT SERVER</b>        | <b>ENGINEERING</b>           |
| Object Oriented Programming | Software Engineering         |
| Graphical User Interfaces   | Real-time Programming        |
| Windows Programmers         | Electronic Systems Engineers |
| <b>TECHNICAL WRITERS</b>    | <b>MAINFRAME</b>             |
| Software Documentation      | Programmer/Analysts          |
| User Manuals                | Systems Analysts             |
|                             | Database Analysts            |
|                             | Database Administrators      |
|                             | <b>NETWORK</b>               |
|                             | Network Engineering          |
|                             | Network Administrators       |

If you thrive on new technical challenges, position yourself with a leader. Call or send in your resume in complete confidence to:



**Software Services Corporation**

2850 S. Industrial Hwy., Suite 300

Ann Arbor, MI 48104

800/448-1568 or 313/971-2300 fax 313/677-0230

Internet careers@software-services.com, Compuserve 70403.1463

Equal Opportunity Employer



# Computer Careers

## QATAR GENERAL PETROLEUM CORPORATION

*QGPC is seeking self-motivated professionals who are able to interact effectively in a multi-cultural society. Qatar General Petroleum Corporation (QGPC) is the national oil company of Qatar with its head office based in the capital city of Doha, QGPC is a large progressive organization with a successful history in the hydrocarbon industry and an exciting programme of developments including the world's largest proven gas reserves, "The North Field".*

### ASSISTANT MANAGER TECHNICAL SUPPORT

Responsibilities are to direct, plan and coordinate the evaluation, implementation, maintenance and optimum utilization of corporate computer hardware, network and operating systems software. Thorough understanding is required of corporate-wide technology architecture blueprint and current technology trends. Solid experience is required in operation management of large IBM installations as well as systems programming. Good communication skills essential.

Candidate must have a degree in Computer Science or equivalent with 15 years relevant I.S. experience including management of large installations. (Ref. No. ICS/1)

### SENIOR SYSTEMS PROGRAMMER (SYSTEMS SUPPORT)

Responsibilities are to direct and/or perform evaluation, development, implementation and maintenance of operating systems and related products; to plan operating systems installations and network set-ups; and to assist in long-range system planning. Good knowledge is required of VM, VSE (SEA), SNA, and TCP/IP, connectivity to RS6000 and similar platforms, network maintenance and recovery after systems failure. Applicant should have a degree in Computer Science, Engineering, or equivalent with 10 years I.S. experience with emphasis on systems programming. (Ref. No. ICS/2)

### PROGRAMMER/ANALYST (END-USER COMPUTING)

In depth knowledge and practical experience in all or the majority of the following area (preferably a certified Novell Network Engineer):

- Design and implementation of LAN's/WAN's utilizing ethernet 10 Base-T and IBM Token-ring network topologies.
- Novell network 3.1x and Novell 4.0x installation, configuration and administration.
- LAN management, trouble shooting and users support.
- LAN/LAN & LAN/WAN connectivity, especially 3270 gateways to IBM mainframe systems.
- LAN/WAN hardware and software components and cabling.
- Training LAN administrators.
- Systems analysis and programming experience in microbased software packages such as Xbase, SQL languages, Oracle.
- Experience in MS/DOS, MS/Windows 3.1, MS office suite, Lotus CC:Mail.

Candidate must have a degree in computer science or equivalent with minimum 5 years' experience (Ref No. ICS/3)

### SYSTEMS ANALYST (END-USER COMPUTING)

In-depth knowledge and practical experience in all of the following areas:

- An excellent awareness of current micro-computer and LAN technology.
- Comparative evaluation and review of LAN operating systems for example, Novell versus MS NT.
- LAN/LAN and LAN/WAN connectivity, especially 3270 gateways to IBM mainframe systems.
- Experience in MS/DOS, MS/Windows 3.11, MS office suite and Lotus cc:Mail.
- Systems analysis and programming experience in microbase software packages such as MS Access, Xbase, SQL languages.
- Evaluation of end-user microcomputer software and hardware and delivery of user services, training and support.

Applicant must have good communication/presentation skills. Applicant must have a degree in computer science or equivalent with 7 years' I.S. experience, emphasizing, end-user service. (Ref. No ICS/4)

### SYSTEMS ANALYST (COMMERCIAL SYSTEMS)

Candidate must have a degree in Computer Science or equivalent with minimum 6 years' solid experience in systems development. Applicant must also be proficient in Oracle RDBMS Development environment, IBM VM and VSE operating systems and associated development tools (i.e. CMS, CICS, COBOL, VSAM), PC database development languages such as dBase, Foxpro, Access. Knowledge of CASE tools and project planning software, and networking and client/server development. Responsibilities include requirements definition and data analysis for new systems development projects (Ref No. ICS/5)

### SYSTEMS ANALYST (TECHNICAL SYSTEMS)

Candidate must have a degree in Computer Science or equivalent with minimum 6 years' solid experience within the oil/gas industry. Applicant must be proficient in FORTRAN and C programming languages, UNIX and VM/ESA operating systems and knowledgeable in networking and graphical interfaces. Responsibilities include development, installation, maintenance and support of petroleum applications running on PCs, UNIX workstations and IBM mainframe using ORACLE development tools. Analysis of user requirements and development of conversion and interface programs (Ref No. ICS/6)

### The Country

Geographically, Qatar is a peninsula projecting into the Arabian Gulf, with a warm coastal climate. Whether you are playing golf, relaxing on our beaches, joining in a range of sports offered at our clubs or savoring the warm welcome and the enjoyable way of life, you will find that Qatar is the undiscovered pearl of the Middle East. This forward progressive, independent state is one of the most accommodating to the western culture where wives and families are encouraged to participate fully in the community. This together with the very obvious financial rewards, add up to one of the most attractive packages available in the Middle East.

### Employment Package

The rewards, like the challenges, are substantial. All positions offer tax free salaries on married status, indefinite term contract, free spacious air-conditioned accommodations, free medical and dental care, children's education assistance, generous annual leave (with paid air-fares). Transport allowance and heavily subsidized sporting facilities.

Candidates should QUOTE appropriate REFERENCE NUMBER, details of current salary, availability and contact telephone/fax. We prefer applications include 2 passport size photos sent to our representative at the following address:



**ROUSTABOUT PUBLICATIONS LTD.**

**Roustabout Publications, Ltd.**  
Dennis Davidson, QGPC Advertisement  
9337-B Katy Freeway  
Suite 302  
Houston, TX 77024

Under direction, to perform UNIX systems administration tasks such as: Performance tailoring and tuning, system backup, capacity planning, installing software, trouble shooting system problems, print management, file transfers, automate manual functions with shell scripts, write "C" utility programs, and slicing RAID disks on various platforms (i.e., System V release 4, Solaris, Windows NT) and relational database management systems (Oracle and Progress), to support users in the UNIX environment; and cooperate with other members of Information Systems staff to meet the District's computing needs.

Requires a Bachelor's Degree in Computer Science or related field, and four (4) years of experience performing UNIX systems administration in an Oracle environment preferably using Oracle Financials. **OPEN UNTIL FILLED.** For more information and an application contact: Eastern Municipal Water District 2045 S. San Jacinto St., P.O. Box 5300, San Jacinto, CA 92581. Phone (909) 925-7676 AA/EOE.

### SENIOR SYSTEMS ADMINISTRATOR

Salary:  
**\$3,690 - \$4,654/Month,**  
plus excellent benefits  
including fully paid PERS.

### CONSULTANTS SHOULD CONSULT

**MIMI**

**IMMEDIATE CONTRACTS**  
Please send resume & call

**Mimi Simon Assoc.**  
90 West St., Suite 1105, NYC 10006

(212) 406-1705  
FAX (212) 406-1768

### INFORMATION INDUSTRIES INC.

Has immediate (SAP) FULL-TIME/CONTRACT CONSULTANT openings with our firm in the southwest US.

**R2 & R3 SYSTEMS ANALYSTS ABAP/4 PROGRAMMERS ALL MODULES**

Excellent compensation, benefits, relocation. FAX resume to

713-861-5935 or call 713-861-9797 **Triple-X**

### COMPUTER

### Large Systems Consultants

Hitachi Data Systems markets a broad array of industry-standard mainframe computers, data storage devices, open systems hardware and software, and information technology consulting services. We are currently seeking Large Systems Consultants for 6 to 18 month assignments.

### Current Requirements:

**MVS/ESA Systems Programmer**  
Must have the following skills: MVS/ESA internals, Diag. skills, MVS/ESA 4.3 of higher, MVS/ESA S.1 would be a plus, SMP/E, and installation and customization of MVS/ESA supported products.

### MVS/ESA Sysprog.

Support person for day to day problems and basic trouble shooting. Must have knowledge of ISPF, JCL, IPCS knowledge and good understanding of MVS/ESA a plus.

### Performance Specialist

Develop daily, weekly and monthly capacity and performance reports, and performance recommendations for MVS/ESA, IMS, DB2, and CICS. Requires knowledge of MVS/ESA, DB2, IMS, CICS, MICS and SAS.

### DB2, IMS, IDMS System Programmer

Install and customize DB2 or IMS monitoring products such as Platinum, Omegamon DB2 and IMS. Knowledge of internals, DB2, IMS, IDMS, Min. release level DB2, 3.1 and IMS 3.1 required. IMS 4.1 a plus as with performance and tuning.

### CICS System Programmer

Handle day to day problems and change request in a CICS/ESA environment. CICS installation and performance and tuning a plus.

### Open Systems Consultants

A variety of positions are available with varying skill levels. A depth of experience in one or more of the following areas is required: UNIX Systems Administration; Networking; Databases; Applications Development; Software Tools; Performance and Tuning; Problem Determination and Resolution.

Hitachi Data Systems offers an environment committed to affirmative action and the development of diverse people. Please send your resume to: Hitachi Data Systems, Attn: THC, 500 Park Blvd., Suite 1200, Itasca, IL 60143-2610. Hitachi Data Systems is an Equal Opportunity Employer.

Trademarks are registered to their respective companies.

### Hitachi Data Systems

System Support Programmer for Northeastern Ohio automobile metal stamping company to monitor & safeguard data on Unix, VAX, Apple Macintosh, DOS & Windows based systems & printers; install & upgrade software applications to assure user access; train users on DOS/Windows applications, including WordPerfect, Lotus, Paradox, dBase, Microsoft Word, Excel & Harvard Graphics; provide desk service to users on software & hardware problems; document information systems related operation procedures; determine needs for new PCs, printers, bar coding & networking equipment; troubleshoot & solve PC, printer, bar coding & networking equipment problems; configure & tune PCs & printers. Applicants will qualify with BS in Computer Science or Management Information Systems (MIS) & 2 years experience in the job described or 2 years experience with monitoring Unix, VAX, Macintosh, DOS & Windows environment & troubleshooting computer & networking equipment problems in these platforms; applying network theory; training users; configuring & finetuning PCs & printers. Experience may have been gained before, during or after degree. Must provide copies of degree(s), transcript(s) & letter(s) confirming the required experience. 40 hours/week (on call 24 hours/day, 6 days/week), 8:00am-5:00pm, M-F, \$36,000/year. Send resume in duplicate & copies of degree(s), transcript(s) & letter(s) confirming the required experience (no calls) to Bob Bilbrey, Plant Controller, Medina Blanking, Inc., PO Box 360513, Cleveland, OH 44136-0009.

## SAMIS CONSULTANTS

A premiere information systems and services provider is seeking experienced SAMIS administrators to maintain a system on-site in Saudi Arabia. These positions, of a 12-18 month duration, are ideal for individuals who are experts on the CSTS II operating system, IMP transaction processing system, current SAMIS tuning, dump analysis and operational support.

Successful candidates will develop SAMIS applications and perform database administration and must have expertise in the MANAGE (formerly ALADIN) database administration system, GPS JCL, current SAMIS application architecture, operational database maintenance, application abort analysis and utility development. Other positions require expertise in INFONET communications software. Applicants must be willing to relocate to Saudi Arabia.

Please fax your resume in confidence to Dept. SAM36 at (703) 734-0485 or mail to Dept. SAM36, P.O. Box 9621, McLean, VA 22102. We are an equal opportunity employer.

Programmer Analyst to analyze, develop & modify MCI call management system & proof positive software in C & SQL using IBM CSet/2 & IBM DB2/2 1.0 integrating & customizing the Network environment & write test cases in C & Assembly for various in-house applications developed for both internal & external users; develop utility for testing network peripheral devices in C using IBM CSet/2; configure, administer & troubleshoot OS/2 Local Area Network based on Token Ring standard; administer & maintain Lotus Notes Servers connected thru same network; Reqs. B.S. in Comp. Sci, Computer Systems or Systems Analysis, 1 yr. exp. in job offered or 1 yr. related exp. as Programmer/Analyst, Consultant/Debug Analyst, systems Programmer, Programmer or Systems Analyst. Must have some related exp. in each of the following: analysis & development of database applications & using IBM CSet/2, Lotus Notes 3.0, OS/2 environment, C & Assembly; \$45,000/yr, 40 hrs/wk, 8a-5p. Must have proof of legal authority to work in U.S. Send resume to D.E.S. Workforce Center, P.O. Box 729 (500 7th St., S.E.), Cedar Rapids, Iowa 52406-0729. Ref. to J.O. IA1100337 "Employer Paid Ad".

### ASSOCIATE ENGINEER

Develop quality software to enhance BASE24 (TM) applications for high technology company involved in the financial industry. Analyze customer and vendor requirements, develop detailed external/internal specifications. Research and resolve customer and vendor problems with development software. Install and test BASE24 (TM) code at customer sites. Proven knowledge of structured programming concepts and database technology, including object oriented design, relational and client/server concepts. Proficiency in C, Pascal and Cobol programming languages. Proven ability utilizing Unix, DOS and Windows operating systems, as well as PC-based development and design tools. Must have B/S Computer Science; 40 hr/wk; \$28,000.00 year. Must have proof of legal authority to work in the United States. Send your resume to Bernard Childerston, Nebraska Department of Labor, P.O. Box 94600, Lincoln, NE 68509. Refer to Job Order NE0132141. This advertisement in paid for by the employer.

## Computerworld recruitment advertising works!

That's because more computer professionals read more recruitment advertisements in *Computerworld* than in any other newspaper. For more information or to place your advertisement, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

**COMPUTERWORLD**

Weekly, Regional, National.  
And it works!



## Willing to Relocate for the Right Opportunity?

Norwest Technical Services is looking for exceptional systems professionals who can keep up with the unprecedented pace at which the banking industry is evolving. We've maintained our competitive edge by hiring ambitious, innovative individuals armed with the technical know-how and communication skills that get results.

As one of the nation's largest information processing companies, we manage the full range of information needs for the multi-billion dollar Norwest Corporation and its many affiliates. **We have immediate openings in CHECK PROCESSING and CASH MANAGEMENT SYSTEMS** for people with solid experience in one or more of the following: **CPCS, Vector, ACH, Wire, Image, and Electronic Check Presentment.** These opportunities encompass systems engineering, consulting, and programming, from the analyst through the project management level.

As a member of our team, you will apply your analysis, problem-solving, and team management skills toward the design and development of integrated technical solutions in a multi-platform environment. You must have technical skills in one or more of the following: **COBOL, BAL, CASE and Client Server technology, DB2, VSAM, CICS and JCL.**

To learn more about these challenging positions, please send your resume and cover letter to: Norwest Technical Services, HR-CW, 255 Second Avenue South, Minneapolis, MN 55479-1049. Equal Opportunity Employer. No agencies please.



**NORWEST TECHNICAL SERVICES**

### MAINFRAME JOBS !

Our clients **CURRENT** needs include:

**P/A's**  
**CICS DB2 IMS**

**DBA's**  
**ORACLE SYBASE**  
**DB2 IMS IDMS**

**SYSTEM PROG.**  
**MVS VTAM DB2**

**INSURANCE**  
**LIFE OR P&C**

**ROBERT SHIELDS & ASSOCIATES**  
P.O. Box 890723, MIS  
Houston, TX 77289-0723  
713/486-1496  
FAX 713/486-1496  
MISJOBS@AOL.COM

### SAUDI ARABIA

- **COMPUTERS & COMMUNICATIONS**
- **APPLICATIONS MANAGERS & PROJECT LEADERS**
- **DATABASE DESIGNERS**

**Al-Khaleej Computers**, the largest provider of Computer Consultants to a large multinational oil company has immediate openings for the following positions.

#### PROJECT LEADERS

To create, develop and administer all applications development contracts, to monitor & administer compliance both with the department and contractors. We require 5 years solid business management experience in computing or communications with good interviewing and negotiating skills. Proficiency with MS Office software products.

#### APPLICATIONS MANAGERS

To manage all aspects of medium to large projects within policies & procedures. We require 10 years experience in computing or communications in systems development with a proven track record of successfully implementing projects on schedule and within budget. Candidate must have knowledge of and experience with ADW, relational databases Client-Server Systems Development and MS Office software products.

We offer extremely attractive TAX-FREE salaries with expat/repatriation tickets, housing & car allowance, medical insurance, paid vacation leave. Please send ASAP or preferably FAX a complete resume to:  
**Al-Khaleej Computers-HRD, P.O. Box 2062,**  
**Al-Khobar 31952, Saudi Arabia.**  
Fax: (966) 3-894-6032.

#### ORACLE DATABASE DESIGNERS & ANALYSTS

To analyze database requirements, design and develop Oracle 7.0 based applications systems. Skills required with Unix, SQL, OS/2, MVS, "C" and GUI development tools, preferably Powerbuilder.

## GREAT IDEAS AT WORK

THERE'S A BIG  
DIFFERENCE BETWEEN

# CREATIVITY AND PRODUCTIVITY.

OUR POSITION  
IS PROOF EACH IS CRITICAL  
TO THE OTHER.

*If you want to create technology that will determine the speed and direction of this industry, you can do it here. Be a part of the push to invent and innovate. Work to discover your own potential, in an environment that merges diverse skills, backgrounds and experience together into a common course: To be the Number One computer company by 1996.*

*Because there's a place for the dreamers that do, and the doers that dream. That place is right here, at Compaq.*

**All positions require a BSCS/CE/EE or equivalent experience.**

### STORAGE MANAGEMENT ENGINEER

-TEST/ANALYSIS-

The successful candidate will be responsible for storage management software vendor evaluation, qualification and selection, as well as level three support for server system products including root cause analysis of problems found. This will include compatibility, performance, reliability, etc. To qualify, we require 5+ years' experience in a PC server development and support environment and knowledge of NetWare, Windows NT, OS/2, UNIX<sup>®</sup>; knowledge of disk and tape storage systems is preferred. Experience testing/analyzing SCSI protocols is also desirable. Dept. TJVP-CW-0306-SME

### DATABASE PERFORMANCE ENGINEER

-HOUSTON AND SAN FRANCISCO BAY AREA -

Successful candidate must have 5+ years' technical experience in RDBMS software development. Necessary are skills in C programming for optimizing the performance of RDBMS software products such as Microsoft SQL Server, Oracle 7 and Sybase in an operating system environment which includes NetWare, SCO UNIX, UNIXware and Windows NT. Knowledge of industry RDBMS benchmarks preferred. Dept. TJVP-CW-0306-DPE

### SAP SYSTEMS ENGINEER

We require experience with SAP R/3 at the application level and an understanding of the operating system internals. This person will also provide technical direction to our server business in the area of SAP R/3 particularly as it relates to capacity planning and performance analysis. Working with our large accounts on SAP R/3 product issues and directions will also be involved. Dept. TJVP-CW-0306-SSE

Compaq offers competitive salaries, comprehensive benefits and an environment that supports creativity, open communication and team involvement. To find out more about joining the Compaq team, submit your resume (ASCII preferred and salary history, indicating Dept. of interest, to: Compaq Computer Corporation, MC 500105, P.O. Box 692000, Houston, TX 77269-2000 or email: careerpaq@compaq.com. An equal opportunity employer m/f/d/v. All trademarks belong to their respective companies.

# COMPAQ



### SYSTEMS SOFTWARE ENGINEER

-PC PORTABLES-

Create and communicate software project definition with Product Marketing, other internal engineering organizations and ISHV project management. Ensure all software deliverables and dependencies are comprehended, tracked and communicated. Requires 4 years' experience in development and/or test of software projects, plus 2 years in a leadership role. Dept. TJVP-CW-0306-SSE

### SYSTEM SOFTWARE DEVELOPMENT ENGINEER

-WINDOWS NT-

Successful candidate will have 2+ years of industry experience with the following: Assembly and C/C++ programming, device drivers, embedded systems, utility applications developer, networking software, development and testing of Windows NT systems and use of Windows NT debugger to identify and solve system problems. Must also understand the interaction of Windows NT with different device and service levels to define and deliver an optimized solution. Dept. TJVP-CW-0306-SSD

### SYSTEM ENGINEER

-THIRD PARTY RELATIONS-

In this position, you will coordinate third party software and hardware vendors for new product development. Must have experience in the following areas: third party project management from product concept through release, presentation skills, MS-DOS and Windows. Dept. DAKP-CW-0306-TTP

### SYSTEM ENGINEER

-SOFTWARE TEST-

Design, develop, maintain and support test strategies, procedures and programs for MS-DOS and MS Windows drivers and application (Win 3.1 and Win95). This position will utilize your interpersonal skills while interfacing with software, hardware and firmware development and test organizations to resolve problems in support of new product release. Must have 2+ years' related experience, programming proficiency in C/C++ and extensive knowledge of software quality assurance and testing methodologies. Working knowledge of Windows or other GUI architecture is desirable. Additional preferred experience included: WINRUNNER, QA Partner and Microsoft TEST. Dept. DAKP-CW-0306-SES



INFORMATION TECHNOLOGY

## How do we compare?



It's like comparing apples to oranges. Cap Gemini, the global leader in information technology and a partner to an impressive array of world renowned corporations, is continuing its major initiative in ST. LOUIS.

As we continue to staff up we are looking for I.T. professionals with 2-4 years' experience to do development work in the following areas, complimented by excellent COBOL programming skills.

CICS DB2 • Focus • COBOL I, II • IMS, DB, DC

Oracle (Financials) • Visual Basic • DB2/2  
• C/C++ • Lotus Notes

Don't miss out on the extraordinary and exceptional career opportunities that exist in St. Louis and other Midwestern locations. To be part of our initiative, mail or fax your resume to: **Staffing, Cap Gemini America, 509 Olive Street, Suite 304, St. Louis, MO 63102.** FAX: 314-231-5594 or by E-mail to Internet address: [cgal1@occ.com](mailto:cgal1@occ.com). We are an equal opportunity employer.



Total Respect • FOR YOUR FUTURE

## Director of Information Technology Operations

A major international consulting firm has an outstanding opportunity in New York for an IT professional with experience in building and managing highly reliable and secure distributed operations. A solid and broad IT knowledge with 5-10 years of experience in the operational management of complex systems environments and in the leadership of a team of 25+ people is essential. You will assume responsibility for the design, implementation and management of the operations of a worldwide network and server environment providing e-mail, groupware and distributed computing capabilities to a highly decentralized and flexible organization.

The talented individual we select will be responsible for the management of the internal operations group at both the center and in our regional support hubs and also for the development of effective relationships with vendors and the exploration of

outsourcing opportunities. You will define the necessary procedures, guidelines and metrics to establish and maintain a reliable systems environment. The success of your organization will be measured against service level agreements with the IT support groups of our local offices.

A successful candidate will have superior skills in "fact-based" problem-solving and oral and written communications which will complement judgements based on technical expertise. You should possess a Master's degree in Engineering or Computer Science or an equivalent and appropriate educational background. Experience in an international environment is strongly preferred. Domestic and international travel is likely to be 20+% of one's time.

We provide an interesting and challenging team-based environment, a competitive starting salary and a comprehensive benefit program. Please send your resume, including salary history, in complete confidence to:

Box 553-MZ, 12th Floor  
360 Lexington Avenue, NY, NY 10017  
We are an equal opportunity employer M/F/D/V

**SENIOR PRODUCT DEVELOPMENT ENGINEER, MASTER SURFACING:** For a Southwestern Ohio MCAE Company. DUTIES: Research, design, develop, enhance and maintain constrained Variational Geometry functionality as part of a commercial, mechanical Computer Aided Engineering (MCAE) design system. All curve, surface and solid modeling functionality is to be written in the C programming language. Responsibilities include: refine end-user needs into an integrated set of software requirements; research existing techniques and devise new approaches using the most effective differential geometry and constrained variational methods; translate engineering theory and best practice into commercial-quality software; define a user interface that is easy-to-use; design and implement the software to perform efficiently and to produce the specified functionality; unit test all software; integrate the software into the MCAE system; fix bugs in the software; create test cases that validate software on different operating systems and hardware platforms; document the algorithms and the software implementation so others can maintain and enhance the software; and support the creation of user level documentation by providing descriptions of the functionality and techniques for applying the functionality to end-user's problems. All of the foregoing responsibilities apply specifically to the development of advanced curve, surface and solid modeling functionality using Non-Uniform Rational B-Splines (NURBS) geometry in a hybrid boundary-representation (BREP)/constructive-solid geometry (CSG) solid modeler. EDUCATION: Bachelor of Science in aeronautical, aerospace, mechanical, industrial, electrical, civil or chemical engineering, mathematics, physics or computer science. Three years of experience in the job described or three years of experience involved in commercial MCAE algorithm research and design is required. The three (3) years of work experience required of the holder of the bachelor's degree must be in commercial MCAE algorithm research and design. As part of the experience, applicant must have implemented these algorithms in MCAE software, personally contributing an average of at least 5,000 lines of source code per year to a larger system of at least 1 million lines of code written in the C, FORTRAN or C++ programming languages. Alternatively, employer will accept in place of the bachelor's degree and three (3) years experience, a master's degree in aeronautical, aerospace, mechanical, industrial, electrical, civil or chemical engineering or in computer science, provided that the candidate has the following: a) two (2) years experience personally contributing at least 10,000 lines of source code to a larger system of at least 1 million lines of code written in the C, FORTRAN or C++ programming languages; and b) six (6) quarter hours of graduate level research and implementation of MCAE software written in the C, FORTRAN or C++ programming languages resulting in a thesis. For all applicants, two (2) years of the required experience must be in the MCAE algorithm research and design in either of the following areas: a) Constrained Variational Geometry of curve, surface or solid models, or b) Constrained Variational Methods and Differential Geometry. All applicants must: a) read, write, speak and understand English; b) have developed and implemented at least two innovative (new or more efficient) algorithms in a commercial MCAE application program or academic project related to MCAE, with a personal contribution for each algorithm of 1,000 lines of code written in the C, FORTRAN or C++ programming languages; c) have three months of MCAE application programming experience or three quarter hours of academic computer science undergraduate or graduate coursework which must emphasize the following computer software engineering concepts: 1. Data structure design and implementation; and 2. Software performance optimization. Candidate must have developed at least two MCAE software programs, with a personal contribution for each program of at least 1,000 lines of source code written in the C, FORTRAN or C++ programming languages, which apply these concepts; d) demonstrate three (3) months of MCAE application programming experience in interactive computer graphics user interface design and development. Alternatively, the candidate will qualify with three quarter hours of undergraduate or graduate coursework, or an academic project, either of which must involve interactive computer graphics user interface MCAE software design and development; e) have three (3) quarter hours of undergraduate or graduate coursework in any of the following areas: Finite Element Methods, Calculus of Variations, Constrained Optimization, Optimal Mechanical Design or Optimal Control Theory; f) demonstrate three (3) quarter hours of undergraduate or graduate coursework in either classical Differential Geometry or Theory of Shells; and g) have completed a MCAE project in industry of three months duration or an academic project of three quarter hours, either of which was devoted to use of Geometric Surface Modeling, Geometric Solid Modeling or Finite Element Methods. Any one academic course or period of commercial working experience may be used to satisfy any number of the above requirements. Employer will accept equivalent academic units for any stated academic requirements. Completion of all master's degree requirements except thesis defense is considered equivalent to receipt of degree. 40 hours per week, 8 a.m. to 5 p.m., Mon - Fri (exempt) SALARY: \$52,000 - \$65,400. Send 2 resumes and cover letters (no calls) to J. Davies, JOB #01015, Ohio Bureau of Employment Services, P.O. Box 1616, Columbus, OH 43216. EOE

**Software Engineer/SAP Consultant** for planning, monitoring, and executing the efficient design and implementation of interfaces, conversion programs, release changes, and modifications to the SAP systems, particularly RM-MAT, RM-PPC, RV and RK modules. Investigating and evaluating user requirements. Assisting with system design and implementation. Systems testing and user training. Requirements: Bachelor's degree in Engineering, Computer Science, Math or Economics. Must speak and read German. Experience: 2 years in the job offered. 40 hrs/wk, 8:30 a.m. to 5:30 p.m., \$80-90,000/yr. Send resumes in duplicate (no calls) to K. Shockey, JOB# 00935, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216. Must have proof of legal authority to work indefinitely in the United States.

**ECOM** Several positions available immediately for DP professionals with the following skills:

- SAP
- IDMS
- ORACLE 7.0, FORMS 4.0
- POWERBUILDER w/ ORACLE or SYBASE
- DATA MODELING w/ ORACLE or SYBASE
- LOTUS NOTES - ADMINISTRATION and/or APPLICATIONS
- SP. BILINGUAL NETWORKING
- SYBASE DBA

Please call or fax/mail resume to **ECOM - Elite Computer Consultants** 10333 NW Frwy, Ste 414 Houston, TX 77092 Phone (713) 686-9740 Fax (713) 686-9454

**TANDEM**  
COBOL, PATHWAY, TAL, SCOBOL, C, SQL, X.25

**STRATUS**  
PL1, COBOL, C, ON/2

**MUMPS UNIX**  
SUN, HP, RS/6000, GUI, SDK Powerbuilder, C++, Visual Basic Fulltime/Consulting Positions available in the US/ABROAD

**STRATEM**  
800-582-JOBS  
TEL (212)967-2910  
FAX (212)967-4205  
124 W. 30th St. Suite #302  
New York, N.Y. 10001

**SOFTWARE CONSULTANTS**  
NATIONWIDE OPENINGS  
VAX/COBOL/RDB SMARTSTAR/SQL VISUAL BASIC ORACLE FINANCIAL

**Application Builders**  
Mail: PO Box 15882  
WPB, FL 33416  
Fax: 407-687-2785

Applications Programmer (Houston, TX area client site) Develop, code, test, implement, and maintain programs for financial and commercial applications systems, using CSP, COBOL, and DB2 on IBM mainframes. Bachelor's degree in Comp. Sci., Math, Engineering, or Business Admin. and 2 yrs. exp. in job req. 40 hrs/wk, 8:30-5, \$36,861/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778, J.O. #TX7211787. Ad Paid by an Equal Opportunity Employer.

Programmer/Analyst (Houston, TX area client site) Responsible for program development, coding, testing, and documentation of ORACLE systems, using PRO\*C and SQL\*Forms in a variety of hardware environments. Bachelor's degree in Comp. Sci., Math, Engineering, or Business Admin. and 2 yrs. exp. in job req. 40 hrs/wk, 8:30-5, \$36,861/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778, J.O. #TX7211791. Ad Paid by an Equal Opportunity Employer.

Applications Programmer (Houston, TX area client site) Design, develop, code, test, maintain, and document financial and commercial applications systems, using COBOL, CICS, and DB2 on IBM mainframes. Bachelor's degree in Comp. Sci., Math, Engineering, or Business Admin. and 2 yrs. exp. in job req. 40 hrs/wk, 8:30-5, \$36,861/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778, J.O. #TX7211790. Ad Paid by an Equal Opportunity Employer.

## FLORIDA Opportunities

- Systems Architect
- CICS, DB2, COBOL
- AS 400, RPG 400 Banking
- SFS or ON/2
- STRATUS or System 88
- Olivetti, Pennacoe Plus
- Progress, Unix
- C, Unix
- Tandem, Scobol, Cobol 85
- Project planner, Access
- Oracle Financials, Foundation
- Pick 2.0
- Powerbuilder, C, C++, OLE
- SAS, PL1
- Assembler, CICS, DB2, Cobol II
- Oracle 7.0, 6.0, SQL Forms
- DCS, MVS

CBA

1511 N. Westshore Blvd.,  
Ste. 260, Tampa, FL 33607  
(813) 287-2100  
FAX 287-2954

## This Space For Hire

Call today to place your recruitment advertisement. 800-343-6474 ext. 201, (in MA, 508/879-0700)

Where do the best computer professionals

look for jobs?

Right here. In fact, more computer pros read more computer recruitment advertising in Computerworld than in any other newspaper.

Talk to the best.

Place your advertisement in Computerworld.

For more information

or to place your ad regionally or

nationally, call

Lisa McGrath at

800-343-6474; x 201

(in MA, 508-879-0700).

Weekly.

Regional.

National.

And it works.

COMPUTERWORLD

McGraw-Hill



# Computer Careers East

## COMPUTERWORLD

Computerworld, the leading newsweekly publication for the computer industry, currently offers the following opportunities:

### Desktop Publishing Support Specialist

A minimum of 2 years experience in a publishing/production environment using Quark XPress, Microsoft Word, Adobe Illustrator and Photoshop, and Aldus Freehand is required. Candidates should also possess a general knowledge of Macintosh System 7.5 and Mac networking. A Bachelor's degree in graphics is a plus, but not required. Contact Christine Chupka, Human Resource Assistant, Code# CWCC.

### Programmer Analyst - FoxPro

Response Technologies, a Boston-area Marketing Response/Database Management firm, and a subsidiary of Computerworld, is interviewing applicants to join our Information Services team. The selected candidate will develop and maintain client applications in FoxPro (DOS and Windows). Responsibilities will include generating client fulfillment and providing technical support to the staff. One to three years' experience programming in FoxPro/dBase required. Demonstrated design and analysis skills essential. BA/BS required, preferably in Computer Science. Novell experience and hardware support experience preferred. Contact Toni O'Connor, Human Resource Manager, Code# CWTO.

We offer a competitive salary and benefits package in a fast-paced environment. Please send resume, referencing Contact Name and Code#, to: Computerworld, 375 Cochituate Road, Framingham, MA 01701-9171.

Fax: (508) 879-3760

An equal opportunity employer...  
by choice.

## CONSULTANTS

There is high demand for your skills and expertise among companies in the Information Technology Industry. You want to make the right career move, yet sometimes it's hard to sort out the hype from reality.

LISTEN to what some of METRO's 1,000 Staff Members said about their Company on a Company-wide Staff Survey conducted last fall. Then, call the Professional Staff Recruiter in the location of your choice to discuss your opportunities.

### WHAT IS THE MOST POSITIVE ASPECT OF METRO?

*"Great Company. Very supportive and people-oriented. The Staff is the best. Not just good, but extremely good."*

*"Working with other Consultants who have a professional approach to their work and take pride in doing the job right."*

*"Opportunity for personal and professional growth and financial gain. Metro provides a unique combination of responsibility and freedom."*

*"Being part of a fast growing, dependable Company."*

*"The ability to further my education and use the skills acquired."*

*"The benefits package is excellent."*

If you are interested in multiple locations or are qualified for a number of opportunities:

Call Kim 800-849-8406 (Ext. 136)

Fax 804-486-0816 (Dept. 195D)

EOE

## METRO Information Services

### CICS, DB2, IDMS, IMS DB/DC, APS, ADS/O

Atlanta, Charlotte, Dallas, Ft. Lauderdale, Greensboro, Houston, Jacksonville, Nashville, Raleigh, Richmond, Roanoke, San Juan, Tampa, Virginia Beach

### C++, OS/2, MS-Windows or Windows/NT

Atlanta, Charlotte, Dallas, Ft. Lauderdale, Greensboro, Houston, Jacksonville, Nashville, Raleigh, Richmond, Tampa

### Visual Basic, Visual C++

Atlanta, Dallas, Ft. Lauderdale, Jacksonville, Nashville, Raleigh, Tampa, Virginia Beach

### C, UNIX, Oracle, SQL

Atlanta, Charlotte, Dallas, Ft. Lauderdale, Greensboro, Houston, Jacksonville, Nashville, Raleigh, Richmond, Tampa

### Oracle, DBA/SQL\*Forms/4-D, DB2/2

Atlanta, Charlotte, Ft. Lauderdale, Jacksonville, Raleigh, Richmond, Tampa

### Peoplesoft

Atlanta, Greensboro, Houston, Nashville, Raleigh, Richmond

### PowerBuilder, Sybase, SQL Server/NT

Atlanta, Charlotte, Dallas, Ft. Lauderdale, Greensboro, Houston, Jacksonville, Nashville, Raleigh, Richmond, Tampa, Winston-Salem

### ADABAS / NATURAL

Atlanta, Charlotte, Greensboro, Richmond, Winston-Salem

### Microfocus COBOL, APS/PC

Charlotte, Jacksonville, Richmond, Tampa

### SAP/ABAP

Ft. Lauderdale, Greensboro, Houston, Nashville, Richmond, Virginia Beach

### FoxPro, Clipper

Charlotte, Raleigh, Richmond, Virginia Beach

### Smalltalk

Charlotte, Dallas, Ft. Lauderdale, Greensboro, Nashville, Raleigh, Virginia Beach

### Special Requirements

ASI-DRP Package (Greensboro, Winston-Salem)  
AS/400 RPG/400, PRISM (Ft. Lauderdale, Greensboro, Jacksonville, Richmond, Winston-Salem)  
Banking, DB2 (San Juan)  
Business Analysts with Client Server Background, Mainframe Programmers and HOGAN (Atlanta, Charlotte, Dallas)  
C++, OOPS, VMS (Ft. Lauderdale, Winston-Salem)  
C, UNIX, AIX Systems Administrators (Atlanta, Dallas, Jacksonville)  
HP-3000, COBOL, Powerhouse (Raleigh)  
Imaging, Informix, Plexus (Richmond)  
LAN/WAN Network Engineer, Novell, Unix, Routers, Host Connectivity (Va. Beach)  
M & D, Millennium, Informix 4GL, Walker (Atlanta)  
Natural, DB2 (Winston-Salem)  
PICK AS/400 COBOL (Virginia Beach)  
SGML/HTML Developers (Virginia Beach)  
SHERPA (Dallas)  
Sun UNIX (OS/2 and Solaris) LAN Administrators (Dallas, Ft. Lauderdale)  
Windows NT/AS Systems Engineers (Dallas)

Atlanta, GA	800-486-5302	Nashville, TN	800-486-5308
	Fax 404-843-5930		Fax 615-373-6904
Charlotte, NC	800-486-5291	Orlando, FL	800-486-5286
	Fax 704-529-6116		Fax 813-286-1011
Dallas/Ft. Worth, TX	800-486-5287	Raleigh, NC	800-486-5289
	Fax 214-490-4681		Fax 919-783-9305
Ft. Lauderdale, FL	800-486-5305	Richmond, VA	800-486-5290
	Fax 305-476-9729		Fax 804-285-7895
Greensboro, NC	800-486-5294	Roanoke, VA	800-486-5294
	Fax 910-665-1844		Fax 910-665-1844
Greenville, SC	800-486-5291	San Juan, PR	800-486-5305
	Fax 803-297-6799		Fax 809-756-8967
Houston, TX	800-486-5063	Tampa, FL	800-486-5286
	Fax 713-871-8962		Fax 813-286-1011
Jacksonville, FL	800-823-1319	Virginia Beach, VA	800-486-5283
	Fax 904-281-1040		Fax 804-431-8215
Miami, FL	800-486-5305	Winston-Salem, NC	800-486-5294
	Fax 305-476-9729		Fax 910-665-1844

## SENIOR AS/400 DEVELOPER

If you are seeking a challenging position in a warm sunny climate in close proximity to beaches, theme parks and other attractions, opportunity is knocking. Harcourt Brace & Company, a major international publisher, has openings for Senior AS/400 Developer/Analysts. Successful candidates must have proven ability in providing solutions for client requirements, AS/400 expertise, and excellent communication & interpersonal skills. Proven RPG/400, APPC LU6.2-Intercommunication, DDS & OS/400, as well as distribution systems & packaged software development required. CA-Warehouse BOSS software experience a major plus. A bachelor's degree in computer science is preferred, &/or equivalent AS/400 work experience. We offer a competitive salary and a comprehensive benefits package including health/dental insurance, 401(k) plan and tuition reimbursement. Please send resume along with salary requirements to:

Harcourt Brace & Company  
Orlando, FL 32887  
Attn: Human Resources SASD-SG

**HARCOURT  
BRACE**

An Equal Opportunity Employer

Software Development Consultant - Represent consulting firm in providing software applications & systems development in a multi-platform, distributed database systems environment using OS/400, SOL/400, COBOL/400, CL/400 & QUERY/400; analyze systems requirements, customize & implement software packages to support accounting, insurance, banking, manufacturing, inventory, & corporate information; convert programs from various existing systems to IBM AS/400 system; perform detailed testing & fine tuning; implement & integrate new software & systems; provide user training & systems support. \$40,000/yr. 40 hrs/wk. M-F. U.S. or foreign equivalent B.S. in C.S., Computer Engg., or Business Admin. & 2 yrs. exp. in job offer or as Software Eng., Systems Analyst, or Programmer Analyst. Background/experience should include use of specific noted skills for software design & development. Submit resume to the GA Dept. of Labor, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3909 or the nearest Dept. of Labor Field Service Office. Job Order #GA 5823051.

DATABASE ADMINISTRATOR: Provide database administration for employer in a client server environment. Coordinate physical changes to computer data bases, and code, test, and implement physical data base, applying knowledge of data base management system. Design logical and physical data bases. Direct programmers and analysts to make changes to data base management systems. Requirements: B.A. or equivalent in Computer Information Systems, and four years verifiable experience in IBM 360, 370, 43XX, 30XX and PC's; DOS/VSE, MVS/XA/ESA, MVS/VSE, VM-CMS, PC/DOS; COBOL, COBOL II, Assembler, PL1, BAL, DB2, S2K, ADABAS, IMS DB/DC, ORACLE, PC DBII; Platinum, Omegamon, Strobe, Microfocus, XDB, TSO/ISPF, VSAM, NATURAL, SOL, CICS, Xpedit, SAS, Easytrieve, Mark IV, ROSCOE, Panvalet, Topsecret, RACF, Merlin, UCC 7, CLIST, CMS, TELON, WP 5.1, Salary \$56,000 per year. Resume to Ms. Pat Ganno, Job Order No: FL-1196070, Job Service of Florida, P.O. Box C, Clearwater, FL 34618-4090. Work site in Tampa Bay Area, Florida.

### FLORIDA - 80 DEGREES!

#### PERMANENT & CONTRACT

DB2, IDMS or IMS P/A's to \$56K  
AS/400 P/A's to \$52K  
HP 3000/9000 P/A's to \$58K  
FOCUS (or) RDB P/A's to \$54K  
SYBASE (or) ORACLE to \$62K  
CICS (or) MSA P/A's to \$53K  
SAP SOFTWARE P/A's to \$55K

For immediate consideration call EDI or FAX your resume to (305) 963-4333.

#### EDI SYSTEMS

450 N. Park Road #320  
Hollywood, FL 33021  
(305) 962-9444  
email: edilla@aol.com

#### PROGRAMMER / ANALYSTS & SYSTEMS PROGRAMMERS

#### FOR CAROLINAS AND SOUTHEAST

Numerous opportunities exist for on-line and data base applications P/A's as well as systems programmers and DBA's. Fee Paid. Please call or send resume to:

Keith Reichle, CPC  
Systems Search, Inc.  
4 Pine Point Rd.  
Lake Wylie, SC 29710  
803/831-2129  
(Local to Charlotte, NC)

## TAMPA/DALLAS

Opportunities for  
DP PROFESSIONALS  
with:

- IDMS/ADSO
- COBOL/DB2/CICS
- OOP/OD DESIGNERS
- RPG400/AS400/BPCS
- BORLAND & VISUAL C++
- INTERGRAPH MDL/DMRS
- POWERBUILDER/SQL/UNIX
- TANDEM/SCOBOL/COBOL
- C & C++/UNIX/XWINDOWS
- DB2/TERADATA/IMS DBA'S
- DATA MODELING & ADMIN
- IDEFI/X/ERWIN/LEVERAGE
- INFORMIX & SYBASE DBA'S
- UNIX/HP-UX/SHELL SCRIPTS
- TELEPHONY BIA'S/PROJ MGRS
- QA ANALYST/GUI/PVCS/SCCS

FOR IMMEDIATE CONSIDERATION CALL  
SYSLOGIC today at

(800) 797-5644 or P.O. Box 26146  
(813) 287-0054 TAMPA, FL 33623  
FAX RESUME TO (813) 282-9511

## Great Jobs - Great Living!

Headquartered in the "Scenic City", Millennium Computer Technology provides a variety of computing related services throughout the US. We have opportunities now for:

COBOL, CICS, IMS, DB2, PL1, DB/DC, DBA, IEF

Windows, C, C++, FoxPro, PowerBuilder, Access, VB, MF COBOL, HP-UX, Solars

If you like learning new technology, low living costs, outdoor living, and a relaxed life style, you need to talk with us.

**Millennium**  
COMPUTER TECHNOLOGY

Recruiting Department  
P.O. Box 4263, Chattanooga, TN 37405  
email: millenni@chattanooga.net  
FAX: (615) 752-0999 PH: 752-0825



# Computer Careers

## East



**One-on-one interviews with your choice of the Northeast's best companies!**

Career Opportunities for IS/MIS, Systems, Software, Engineering and Other Technical Professionals

### BOSTON TECHNICAL CAREER FAIRS

**Monday, March 13: 3pm - 7pm**

Radisson Inn • 75 Felton St. • Marlborough, MA (Exit 24B off of I-495)

**Tuesday, March 14: 3pm - 7pm &**

**Wednesday, March 15: 10am - 2pm**

Guest Quarters Suites Hotel • Waltham, MA (Exit 27B off of Route 128)

To receive personalized Priority Access Services FAX your resumé to:  
804-490-7448 Attn: BOCWMAR95.

### NEW YORK TECHNICAL CAREER FAIR

**Tuesday, March 21: 10am - 2pm & 4pm - 7pm**

Loews New York Hotel • Lexington Ave. at 51st St. • New York, NY

To receive personalized Priority Access Services FAX your resumé to:  
804-490-7448 Attn: NYCWMAR95.

### ALSO UPCOMING: NEW JERSEY TECHNICAL CAREER FAIR

Monday, May 1: 3pm - 8pm • Embassy Suites Hotel • Piscataway, NJ

Tuesday, May 2: 3pm - 8pm • Embassy Suites Hotel • Parsippany, NJ

To receive personalized Priority Access Services FAX your resumé to:  
804-490-7448 Attn: NJCWMAY95.

### Participating Companies Include:

- Fidelity Investments
- Quantum Corp.
- Corporate Software
- Banyan Systems
- Digital Equipment Corporation
- Lockheed Sanders
- Hewlett Packard
- Andersen Consulting
- Dozens more at each location!
- The Mathworks

• NO COST • NO OBLIGATION •

Produced by:  
The Lendman Group

For more information call (800) 765-4473

Redefining The Industry

### Data Warehouse Analyst

With \$2 billion in annual premiums, Progressive is the nation's ninth largest property/casualty insurance company and we ranked #1 in a recent study of the top publicly held companies in Ohio. We are a company determined to redefine the insurance industry by breaking traditional thinking. We are moving many of our systems from a large mainframe environment to a multi-platform, client/server environment supported with effective decision support tools and methods. To help support our continued success, we are seeking an Information Systems professional to design and implement Data Warehouses and data access tool evaluations.

The successful candidate will possess:

- Experience with the design and building of Data Warehouses
- Understanding of OLAP versus OLTP
- Working knowledge of Oracle or DB2 database and DB2/2 a plus
- Extensive SQL experience
- Excellent communication and analytical skills

### The only constant is change.

Progressive is located on a beautiful new suburban campus in northeast Ohio.

If you meet the above qualifications and are interested in joining our team, fax your resume to 216.446.4130; or send to: **Progressive; I/S Human Resources; Dept. 9503-CW-GS; 6300 Wilson Mills Road - North Building; Mayfield Village, OH 44143.**

Or for more information on our benefits and compensation package, please call our 24 hour job source line at 1.800.888.HIRE. Equal Opportunity Employer, M/F/D/V.

**PROGRESSIVE**

## Thomas & Betts

At Thomas & Betts, we create technology, growth, and opportunity. We're the largest North American producer of electrical and electronic components, a billion+ dollar Fortune 500 company. Right now, we're creating an opportunity for the following position:

### Application Programming Manager

We seek an individual to lead the order entry and financial systems programming teams. Our ideal candidate will possess a Bachelor's degree, 8-10 years progressive experience in systems analysis and design with specific experience in order entry, financial systems, COBOL, CICS, IMS & DB2. Excellent problem solving skills and an ability to understand the ramifications of action taking and decision making is a must. We process 3,000 orders per day for eight different, but connected business units representing 20,000 SKU's and over \$1 billion in sales annually.

### Data Base Administrator

This dynamic position requires three plus years IMS Data Base administration. Applicants should have experience as Sr. Programmer/Analyst. The individual will be involved with developing and implementing software on IBM hardware using MVS/JCL, CICS COBOL, TSO/ISPF, VSAM, CEDF, EMS/DC.

Thomas & Betts, not only offers exciting technological challenges and career growth potential, but also a competitive salary and benefits package. To apply, please send your resume with salary history and requirements to: **Human Resources, DL 306, Thomas & Betts Corporation, 1555 Lynnfield Road, Memphis, TN 38119. EOE M/F/D/V.**

### INVEST IN YOUR FUTURE

CIBER, Inc., a recognized national public corporation, is a pioneer in the concept of technology support. In our 20th year, we are proud to say that we have been ranked #32 in Forbes Magazine's list of the 200 best small companies in the U.S. CIBER has grown at an average rate in excess of 30% per year since inception. To continue this tremendous expansion, we need your expertise in the following areas:

- IMS DB/DC
- DB2/CICS/COROL
- C/UNIX, C++
- X-WINDOWS, MOTIF
- GUPTA/SQL
- VISUAL BASIC
- SAP R2 & R3
- INGRES 4GL
- ORACLE FINANCIALS
- POWERBUILDER
- ORACLE 7.0, DBA'S
- LOTUS NOTES
- MEDIPAC
- SMS

If you are interested in joining a company with two decades of rapid growth, we can offer competitive salaries, bonuses and a comprehensive benefits program including a 401K plan, and stock purchase plan. Please mail or fax resume to:



CIBER, Inc.  
DNCW3695  
1500 Ardmore Blvd., Suite 402  
Pittsburgh, PA 15221-5298

(412) 243-9020 (phone) • (412) 243-9030 (fax)

**SYSTEMS ANALYST.** Design, develop, test, & implement application software for Financial & Office automation applications. M.S., CS or EE. 1 yr exp as Assistant Systems Analyst or Software Eng. Proficiency w/ client-server architecture; O-O principles; database principles; C/370 & IBM mainframes using MVS/ESA operating system; DB2 & PL/1, & IBM PS/2 under OS/2 environment w/ Presentation Manager; legacy databases (IMS/DB); & Database Manager (DB2/2). Proficiency in development and implementation of financial application software is desirable. 40 hrs/wk. \$30,850-\$45,200/yr. All resumes must include SS #. Send resume to Job Service, 700 Wade Ave., PO Box 27227, Raleigh, NC 27611 or your nearest Job Service office. Refer to J.O. # NC 7245796, DOT Code 030.167-014. If not a U.S. citizen, specify current visa status.

#### DBA'S

DB2.IEF Encyclopedia.....\$60K  
ORACLE.....\$60's  
ADABAS/NATURAL.....\$50K

#### OTHER NEEDS

P/A ADABAS/NATURAL.....\$40's  
SR P/A AS400.BPCS.....\$50's  
P/A SYBASE POWERBUILDER.....\$50's  
PROJ LDR.CREDIT.CARD.EXP.....\$60K  
SYS PGMR.DB2.....\$50's  
P/A AS/400 RPG.....\$40K  
SYS PGMR.DASD.MGMT.....\$50K  
P/A COBOL.CICS.DB2.....\$50's  
CONSULTANTS COBOL.IMS.....\$40's  
SUB CONTRACTORS.INGRES.....  
HOURLY-RATE & PER-DIEM

AMERICAN PERSONNEL, INC.  
P.O. BOX 667386  
CHARLOTTE, NC 28266-7386  
(704) 398-1899  
FAX (704) 529-1027

**SYSTEMS ANALYST.** Design and develop device drivers for interfacing w/ various Input/Output devices & serial communication under UNIX using C, & to port device drivers & system software across different UNIX platforms. B.S. in CS or EE, & 2 yrs exp as Assistant Systems Analyst or Software Engineer or, in the alternative, an M.S. in CS or EE & one year exp in these occup. Exp shd be in area of design & development of device drivers under UNIX to interface w/ Input/Output devices; design & development of SCSI device drivers & serial communication drivers under UNIX; & the porting of device drivers & system software across different UNIX platforms. Proficiency in 'C' under UNIX required. 40 hrs/wk. \$30,850-\$42,600/yr. All resumes must include SS #. Send resume to Job Service, 700 Wade Ave., PO Box 27227, Raleigh, NC 27611 or your nearest Job Service office. Refer to J.O. # NC 7245795, DOT Code 030.167-014. If not a U.S. citizen, specify current visa status.

Where do  
the best  
computer  
professionals

look for  
jobs?

Right here.

In fact, more  
computer pros  
read more computer  
recruitment advertising  
in *Computerworld* than  
in any other newspaper.

Talk to the best.

Place your  
advertisement  
in *Computerworld*.

For more  
information

or to place your  
ad regionally or  
nationally, call

**Lisa McGrath at**

**800-343-6474; x 201**

(in MA, 508-879-0700).

Weekly.

Regional.

National.

And it works.

**COMPUTERWORLD**

McGraw-Hill



## Developing Careers In Developing Technologies

Join Florida's Leader In Consulting,  
Training and Permanent Placement.



### Client/Server

- C • Visual C++ • MFC/SDK
- PowerBuilder • Oracle
- Informix • Sybase
- Visual Basic / MS Access
- UNIX • Lotus Notes
- PC Express • C++ OS/2

### IBM Mainframe/Midrange

- DB2/CICS • IMS DB/DC
- COBOL • AS400 RPG

### Application Software

- Arthur Andersen DCS, MACPAC
- SAP, MM, PP • M&D Payroll, HR

### Occupations

- Object Oriented Analysis, Design & Implementation Experts
- Sr. Programmer/Analysts
- Business Analysis
- Business Development Manager
- Technical Recruiter
- Project Leaders
- X-Windows Instructor

### Tampa Bay Area

12225 28th Street North  
St Petersburg, FL 33716  
800-554-7206  
Fax 813-572-6088

### Ft. Lauderdale Area

3265 Meridian Pkwy  
Suite 122  
Ft Lauderdale, FL 33331  
800-777-8603  
Fax 305-389-0204

### Orlando Area

201 E. Pine St  
Suite 1305  
Orlando, FL 32801  
800-299-9953  
Fax 407-843-8153

### Jacksonville Area

8375 Dix Ellis Trail  
Suite 403  
Jacksonville, FL 32256  
(904) 464-0220  
Fax (904) 464-0290



**COMPUTERPEOPLE**

A Unit of Decision Consultants, Inc.

## Honeywell

## Programmer/ Analyst

Honeywell's MICRO SWITCH Division in Freeport, IL, a worldwide leader in sensing and control products, is seeking experienced programmer/analysts to join our information systems group. Incumbents will provide professional consulting, systems analysis, design and development services in support of our customer order management system.

A bachelor's degree in management information systems, computer science or equivalent is required; master's degree is preferred. Three to five years of experience with UNIX, COBOL and SQL is required. Previous development experience in order management processes is desirable.

Our offer includes an excellent compensation and benefits package. Please send your resume with salary history in confidence to: **Rob Rossi, Staffing Team Leader, Honeywell, MICRO SWITCH Division, 11 West Spring Street, Freeport, IL 61032.** Equal Opportunity Employer M/F/H/V.

# Your vision can become reality at Bank of America

At Bank of America, our phenomenal success relies on a highly evolved technical paradigm that boasts next generation technologies in virtually every discipline imaginable. Our innovative technical perspective offers dynamic projects that will challenge the mind and raise a few eyebrows. Currently, we're pushing the state-of-the-art in client/server, open systems, and three tier architecture development and implementation and can offer visionary career opportunities to the best technical professionals in the following areas:

## San Francisco Bay Area Opportunities System Director, Client/Server Development

In this highly visible position, you will provide leadership, direction, methodology and discipline for the Client/ Server Development group. Specifically, you will oversee development and integration of multiple major projects, negotiate major systems priorities, analyze and recommend technology selections, and ensure objectives are met on time and within budget.

Requires 8+ years' application development experience with open systems in a MS Windows or UNIX environment, 4+ years' experience in a senior management role, and a proven track record of developing and implementing full life cycle, large scale client/server applications. Exceptional leadership, analytical and negotiation skills should be complemented by a visionary and strategic orientation. Must be results-oriented with proven client/server development experience. **JOB CODE: SD**

## System Architects

Be an integral member of a team that will redefine computing for modern banking via the creation of a progressive bank-wide architecture, blueprint and standards. Candidates must have substantive, hands-on experience in the following disciplines: three tier architecture, distributed security, systems management, open systems, object-oriented methodology, data modeling, RDBMS, software development life cycle, and advanced networking — preferably in a heterogeneous environment of UNIX, NT IBM mainframe, Tandem, etc. A forward thinking orientation and exceptional analytical skills are preferred. **JOB CODE: SA**

## Open Systems Consultants

Interface with developers and business units to analyze business requirements, identify technologies, and support application development or enhancement throughout the project's lifecycle. Additionally, you will provide business process reengineering, environmental solutions (LAN, WAN, connectivity, DBA, operations), and systems integration services.

Requires 3+ years' experience with open systems technologies across all platforms and networks as well as extensive experience working with end users in developing specifications for applications. Familiarity with leading-edge networks, databases, development tools, and project management is essential. Strong communication, written and analytical skills are a must. Previous experience with a Big Six consulting firm is a definite advantage. **JOB CODE: OSC**

## Object-Oriented Developers

Join a team of talented OO developers charged with the implementation of high-end, OO distributed applications for the Bank. Candidates must have demonstrated experience with OO design and development methodology and core object development (business objects, external interfaces, class structure and construction). Expertise with two or more of the following is essential: OO design tools, MS Windows, C++, Motif/X11, ORB(DSOM), UNIX, CICS/6000 and/or RDBMS design. **JOB CODE: OO**

## Datawarehouse Developers

Candidates must possess strong RDBMS experience, preferably with Oracle, and Decision Support/MIS experience including views, "drill downs" and canned reports. Additional requirements include data modeling experience and a mix of DBA and applications expertise. Working knowledge of Powerbuilder, Visual, C/C++ and the ability to work with end users are highly desirable. **JOB CODE: DD**

## Business Object Developers

You will design and implement business objects as well as develop an infrastructure that allows for interoperability of business objects and business functions. Requires experience in building reusable objects in either C++ or SmallTalk. **JOB CODE: BOD**

Act now and get in on the ground floor of these exciting new development projects and benefit from partnering with a technological and financial leader. For consideration, mail, fax, or e-mail your resume, indicating appropriate Job Code, to: Bank of America, Northern California Human Resources Center, P.O. Box 37000, Dept. 8291/cpw, San Francisco, CA 94137. FAX: (510) 675-5818. E-mail address: isaacapp@aol.com Bank of America is an equal opportunity employer.

BANKING ON AMERICA™



**Bank of America**

## CONSULTING COMPANY IN ACQUISITION MODE

Expanding national computer consulting firm looking to continue our growth through acquisition.

Logan/Britton is interested in acquiring consulting firms in new regions or adding to existing regions. Minimum size of 5 consultants.

**ATTN CONSULTANTS:** If you can deliver projects, through your contacts, but do not want to be an owner, please call us to discuss a joint venture.

Tom O'Shea, President

**Logan/Britton**

3300 S. Gessner, Suite 203, Houston, TX 77063

1-800-362-4352 FAX: (713) 266-0263

Pacific Northwest



We have a proven track record of systems integration and information services consulting. Our 7 years of double digit growth and market leadership is due to our strong ethics, skilled employees and ability to offer top pay.

PDG offers an attractive compensation and benefits package. For immediate consideration, mail, fax or e-mail your resume to: Pacific Data Group, Inc., 10300 SW Greenburg Road, Suite 230, Dept C, Portland, OR 97233. Fax: (503) 293-3898. Tel: 503-293-2499.

Internet: 70540.314@compuserve.com.

- ◆ DB2, CICS
- ◆ IMS DB/DC
- ◆ IDMS/DC
- ◆ IDS/II
- ◆ COBOL, CSP
- ◆ Hiron
- ◆ C/C++
- ◆ PowerBuilder
- ◆ Oracle V6/V7
- ◆ Oracle Forms
- ◆ Oracle Case
- ◆ Windows NT
- ◆ Visual Basic
- ◆ SQL Server
- ◆ SQL Windows
- ◆ HP3000
- ◆ RAD/JAD
- ◆ IEF, ADW

## CONSULTANTS

- All Technologies
- Nationwide Openings
- Salaried or Project Basis
- 2+ Years Experience

Send/Fax resume to:  
**Analysts International Corp.**  
P.O. Box 39612  
Minneapolis, MN 55439  
Fax (612) 897-4693

## IE/IEF



We are responsible for the delivery of several multi year, full life cycle IE/IEF projects. Please contact MTW if your background includes any:

- Process and Data Modeling
- IE Stages BAA2 thru Production
- IEF Database or Technical Support

We are dedicated to IE project engagements, and have been a TIEF Alliance Partner since 1990.

2300 Main St. #900, Kansas City, MO 64108  
(816) 421-5005 • (800) 669-9689  
Fax (816) 471-7918



## In The Middle Of Every Difficulty Lies Opportunity.

### APPLICATIONS MANAGER

We have an urgent need for a Manager of Tools and Testing to support our Applications Development environment. This key person will manage a group of 5 teams responsible for the R&D of tools, as well as the roll-out and development needed to successfully implement the tools in a quality manner. If you have technical expertise in all systems analysis functions and experience in business process reengineering, distributed systems development, and/or OOP, we have an exciting opportunity for you.

### SOFTWARE DEVELOPMENT MANAGERS

Lead teams in the development of new testing strategies, define testing/quality improvements area, work with development to prioritize them, and implement them in a quality and timely manner. With a proven track record in leading application development teams, PM skills, and technical expertise in systems analysis functions, you can put your recent experience in business process reengineering, OA software, Viasoft ESW, MicroFocus Workbench and RDBMS to work.

### CHANGE MANAGEMENT SYSTEMS SPECIALISTS

This newly formed group of JCL, Endeavor, INFOMAN, and Information Security experts who support our production environment is seeking other change agents who are committed to our new vision. If you have a strong technical background, customer presentation skills, and an ability to have a good time, you'll like working with this dynamic team.

### CYCLE SUPPORT

Our command center seeks candidates with 2-3+ years experience in JCL, CA-7, ROSCOE, or TSO, CICS, COBOL programming. If you enjoy trouble-shooting, shifting daily priorities, and making presentations to users including CEO's, you will want to work in our high-energy environment.

### PROGRAMMER ANALYSTS

We have multiple openings for experienced programmers with any of the following skill sets:



#### ASSEMBLER

- Assembler (BAL)
- MVS/JCL
- VSAM/IDCAMS
- TSO

#### COBOL and/or DB2 CICS

- Cobol/Cobol II
- MVS/JCL
- VSAM/IDCAMS
- TSO

**FIRST DATA CARD SERVICES GROUP** is the core business unit of **First Data Corporation**, a NYSE listed provider of high-quality, high volume information processing services, with annual revenues exceeding \$2 billion. We're a major player on the Information Super Highway. Our business is an exciting high-technology world driven by people with ideas.

**First Data** offers a competitive salary structure and outstanding benefits featuring Life/Medical, Dental, Vision, Legal, 401(k), Retirement, Stock Purchase Plans, Tuition Reimbursement, Career Guidance, Relocation and more. If you would like to be considered for a position with us, mail/FAX (402-222-6464) resume, indicating position of interest to: **Geoff Castra (CW)**

**First Data Card Services Group**  
10826 Farnam Drive T-12  
Omaha, NE 68154

Affirmative Action/Equal Opportunity Employer M/F/D/V

FIRST DATA  
CARD SERVICES  
GROUP



LOOKING TO  
A BRIGHT  
FUTURE

## MANAGEMENT INFORMATION SYSTEMS PROFESSIONALS

### GROWTH

Wal-Mart, the nation's leading retailer with 1994 sales of \$83 billion, currently operates over 2,000 stores in the U.S. and international trade areas. Planned growth includes the addition of over 150 new stores annually and projected sales of \$100 billion by the year 1996.

### OPPORTUNITY

Due to our continued expansion plans, Wal-Mart provides tremendous opportunity for Information Systems professionals seeking stable career opportunities in a high-energy, challenging environment. Practical experience in retail, manufacturing, distribution or replenishment is helpful.

### THE NATURAL STATE

All positions are centralized in Wal-Mart's Corporate Offices located in Bentonville, Arkansas near the beautiful Ozark Mountains, Beaver Lake, and the University of Arkansas. In Northwest Arkansas you will discover a lifestyle that combines urban amenities, easy commuting and one of the lowest costs of living in the nation. It's a wonderful place to raise a family, and we ought to know: Wal-Mart's corporate family is one of the biggest and best in the nation.

We are seeking Applications Programmers/Analysts, Systems Programmers/Analysts and Communications Engineers with a 4-year degree or equivalent experience, plus a minimum of two years work experience in one of the following areas:

<b>APPLICATIONS DEVELOPMENT:</b>	Requires Unix, C or C++, Informix 4GL/SQL
<b>DATABASE ADMINISTRATOR:</b>	DBA experience in IMS, DB2, Informix On-Line or other RDBMS on Unix and Teradata.
<b>POINT OF SALE DEVELOPERS:</b>	Requires C, Basic and PC experience - Unix and 4680 experience is a plus
<b>WORK STATION DEVELOPMENT:</b>	Requires Dos/Windows, C or C++, Visual Basic - Client Server architecture experience preferred
<b>SYSTEMS PROGRAMMERS:</b>	Requires Unix/OS, Programming in C, Shell Script, and Distributed Networks - C++ and X Windows or X.400 and X.500 is a plus
<b>COMMUNICATIONS ENGINEERS:</b>	Requires TCP/IP, Routers, LAN troubleshooting, and Unix experience Multi-plexors, T1/T3 experience is a plus
<b>IBM MAINFRAME:</b>	Programming skills in MBP Cobol and Btrieve and/or programming skills in Cobol, CICS, IMS, JCL, and DB2-PC Workstation experience and/or Unix/C is a plus
<b>DATA ANALYSTS:</b>	Performs conceptual and logical data analysis, design and modeling using I.E. methodology
<b>SYSTEMS ENGINEERS:</b>	Requires experience with multiple Novell Servers operating 3.1 and 4.x versions. Experience should include Novell NFS, TCP/IP and IPX/SPX experience.

**WAL-MART**  
An Equal Opportunity Employer

If you are willing to relocate to beautiful Northwest Arkansas to begin a dynamic career with Wal-Mart, send your resume with salary history to:

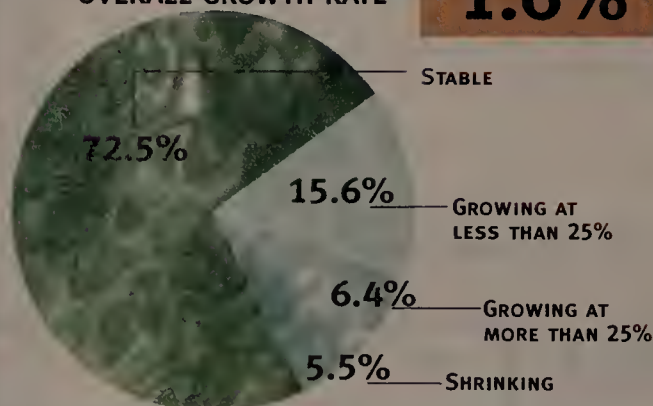
**Wal-Mart Home Office**  
Information Systems Division Recruiting  
702 SW 8th Street, Bentonville, AR 72716  
501-273-6879 FAX

## CAREER SURVEY: Defense

### INDUSTRY HIRING TRENDS

OVERALL GROWTH RATE

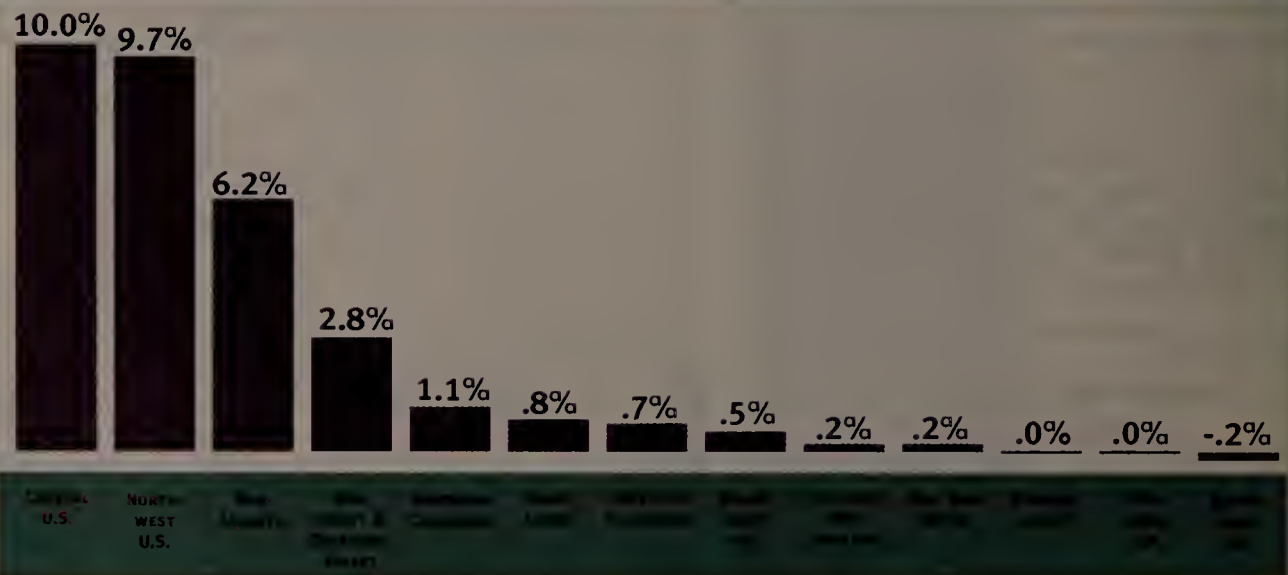
1.6%



SURVEY BASE: 334 TECHNOLOGY FIRMS INVOLVED IN DEFENSE

SURVEY CONDUCTED BETWEEN AUGUST '94 AND FEBRUARY '95;

### REGIONAL GROWTH ANALYSIS



**CORPTECH**, A DIRECTORY PUBLISHER IN WOBURN, MASS., TRACKS THE U.S. 35,000 TECHNOLOGY MANUFACTURERS. THIS SURVEY RELATES TO THE 29,383 TRACKED FIRMS WITH FEWER THAN 1,000 EMPLOYEES.



# Conference Call

1995

CORPORATE  
TECHNICAL  
RECRUITING  
CONFERENCE

COMPUTERWORLD  
Microsoft takes the IBM pump client/server

**Computerworld's Corporate Technical Recruiting Conference**  
**Suburban Denver, Colorado**  
**June 11-14, 1995**

**For more information, call**  
**1-800-488-9204**

---

*Clip and **FAX** this coupon to **1-508-875-3202** or call **1-800-488-9204** for more information.*

**Please place my name on your mailing list, so I'll receive registration materials and information throughout the year.**

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

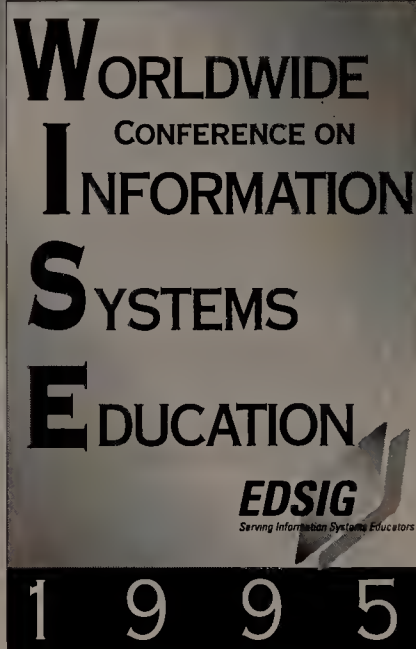
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ e-mail \_\_\_\_\_

CTRC



# Conference Call



**EDSIG's Worldwide Conference on Information Systems Education**  
**Suburban Denver, Colorado**  
**June 11-14, 1995**

**For more information, call**  
**1-800-488-9204**

---

*Clip and **FAX** this coupon to 1-508-875-3202 or call 1-800-488-9204 for more information.*

**Please place my name on your mailing list, so I'll receive registration materials and information throughout the year.**

Name \_\_\_\_\_ Title \_\_\_\_\_

Institution or Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ e-mail \_\_\_\_\_

WISE



## KEEPING SECRETS

*E-mail privacy products are still scarce, although the market continues to evolve*

By Derek Slater



**Electronic mail** can be a great platform for corporate communication, but is E-mail a safe way to discuss impending mergers, layoffs or other sensitive matters?

"It depends on what's being transmitted," says Joyce Graff, E-mail analyst at Gartner Group, Inc. in Stamford, Conn. "If someone sends you a message that says, 'I'm depositing \$1.5 million in your bank,' you may want the content encrypted, or you may need a way to authenticate the sender's identity," Graff says.

Companies that need to ensure messages are read only by the right eyes will want to look into E-mail privacy products. Unfortunately, analysts say pickings are still slim in this evolving market.

### Encryption options

Standard E-mail packages such as Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s Mail offer built-in encryption. And they work fine if the sender and receiver use the same package; otherwise, encryption is lost and an add-on product is required.

Most popular encryption products are built around "public key/private key" technology. In a nutshell, a user can disseminate a public key that allows anyone to encrypt E-mail for that user. The messages can be decrypted only with the user's private key.

A key player in encryption is RSA Data Security, Inc. in Redwood Shores, Calif. RSA Data Security offers several products — some free for noncommercial use

— and holds copyrights on important public/private key technology. Other vendors with high-end security solutions include Northern Telecom, Inc. with its Entrust product and National Semiconductor Corp.'s IPower.

Pretty Good Privacy (PGP) has become an increasingly common option. PGP is a technology that is implemented by several vendors, including ViaCrypt in Phoenix. The Internet Engineering Task Force's Privacy Enhanced Mail standard is another emerging technology.

"Generally, you must ask the vendors what they have to offer [with regard to each security mechanism], and they'll either have a story to tell or they won't," Graff says.

Of course, both the sender and the receiver of the message must have the same security mechanisms for the encryption and decryption to work. Currently, there is no universal encryption product for ad hoc communications.

Analysts say there are other factors contributing to the slow emergence of E-mail privacy products. The first is uncertain user demand as corporations struggle to balance the need against the cost.

"Customers are still trying to figure

out how much they care. It's like putting air bags in a car — if it costs \$100, sure. For \$1,000, maybe. For \$5,000, no thank you," Graff says.

The second concern might be called the hassle factor. "What you're looking

for is an encryption product with two buttons on the screen. One says encrypt; the other says decrypt. You click, and the product does everything else for you. I haven't seen that product yet," says Eric Arnum, editor of the newsletter "Electronic Mail and Messaging Systems" in Washington.

Generating

keys, attaching them to messages and tracking public and private keys is complex. Arnum notes that E-mail management is labor-intensive, and encryption adds to that problem. For example, if a user's key is lost or corrupted, encrypted messages and files will remain locked. "The question for IS is: Do you want rather tricky products being used by people who don't know the inside-outs of their computer systems?" Arnum asks.

For that reason, many firms will choose not to implement encryption in a general way, analysts say.

Eventually, public keys may be maintained in a central repository such as an X.500 directory, Graff says. But such a solution is still down the road. ■

Slater is a freelance writer in Ashland, Mass.

## Internet commerce inches forward

The mere thought of sending a credit-card number, whether corporate or private, over the low-security Internet gives most people the chills.

Joyce Graff, E-mail analyst at Gartner Group, compares sending sensitive information over the Internet to "putting the gold shipment on a stagecoach and sending it through outlaw territory."

But where there's a will, there's a way. Several companies are now hoping to make commercial transactions on the Internet secure and viable.

Net Market Co., a small firm in Nashua, N.H., has created an on-line shopping mall. Encryption software safely allows the buyer to E-mail a credit-card number to the seller, the company said. But this approach is oriented more toward consumers than large businesses.

Cheyenne, Wyo.-based First Virtual Holdings, Inc.'s approach doesn't send sensitive numbers over the line.

Firms or individuals can open buyers' or sellers' accounts with First Virtual Holdings for a minimal fee. Credit-card information for the account is stored on secure systems at transaction-processing giant Electronic Data Systems Corp. Using this method, buyers can send the account number and desired purchase to the seller. EDS then messages the buyer for verification before charging the account and crediting the seller.

Only time will tell whether either method makes the Internet a more secure and popular place to conduct business. — Derek Slater

### COMPANIES IN THIS ARTICLE:

- Lotus (CC:Mail division)  
Mountain View, Calif.
- Microsoft  
Redmond, Wash.
- RSA Data Security  
Redwood Shores, Calif.
- Northern Telecom  
Nashville
- National Semiconductor  
Santa Clara, Calif.
- ViaCrypt  
Phoenix

### Data Center Design & Construction

#### WHEN A DATA COMMUNICATION CENTER IS YOUR FUTURE...

- Uninterruptible Power
- Fire Suppression
- Diesel Generators
- Access Control
- Data/Tele Communication Equipment Planning



- Redundant Cooling System
- Environmental Monitoring
- Consolidation, Relocation, Expanding Evaluation Services
- Design, Engineering and General Construction Solutions

BE SURE TO SELECT THE RIGHT TECHNOLOGY SPECIALIST



**BRUNS-PAK, INC.**  
300 B CORPORATE COURT  
SOUTH PLAINFIELD, NJ 07080  
(908) 756-1222



THE DATA CENTER SOLUTION

► See Us At Interop & Network Booth # 4010 NLM Scheduler

### DO YOU NEED TO UNLOAD YOUR DATA BASE BEFORE BACKUP?

**NLMAuto™ Automatically Loads & Unloads NLM's.**

#### What NLMAuto™ Will Do For You

- ▲ Eliminate the need to manually load and unload databases
- ▲ Improve cache performance
- ▲ Increase network security
- ▲ Reduce after hours work

**CALL TODAY TO ORDER. UNCONDITIONAL MONEY BACK GUARANTEE!**



**1-800-333-8698**

FAX: (602) 545-0008  
Knazall Systems  
375 E. Elliot Rd, #10  
Chandler, AZ 85225

A Division of Tangrom Enterprise Solutions, Inc.



yes  
NetWare  
Tested and  
Approved



# New Products - Hardware - Software

Computer Presentations

**NEW!**



**BEST SELLER**

**Affordable color!** Our most popular product just got even better. Better wall-sized true-color projection at the same unbeatable price. The BOXLIGHT ColorShow 1200 is our best seller for a good reason - value!

**BOXLIGHT 1200. \$2,299**

- ◆ 24,389 vibrant colors
- ◆ Universal PC and Mac compatibility
- ◆ Compact, portable design
- ◆ FREE remote control and cables
- ◆ Brightest color at any price
- ◆ Now with faster mouse response!

**BOXLIGHT: Your direct source for all the bright answers.**

- ◆ More than 50 models in stock
- ◆ Instant availability
- ◆ Overnight shipping
- ◆ 30-day guarantee and extended warranties
- ◆ Expert technical support

## Three for the show.

**COLORSHOW 2000. \$3,999**

The ONLY "all-in-one" LCD data projector priced under \$4,000 is now available exclusively from BOXLIGHT! The sleek, compact design offers unobtrusive operation in the boardroom and folds for ultimate portability. The bright STN technology delivers rich brilliant color from your PC or Mac. If the convenience and performance of an integrated projector is right for you, the ColorShow 2000 is unbeatable.



**INTRO PRICE**

- ◆ Sleek, compact and stylish design
- ◆ Compatible with PC or Mac
- ◆ Less than 20 lbs. travel weight
- ◆ Includes free remote control
- ◆ Optional Computer Control Wand



**SPECIAL OFFER**

Active-matrix Color at a passive matrix price! TFT 24-bit processing for photo-realistic color in an under \$3,000 panel! Fast-changing meetings require the speed of active-matrix technology. BOXLIGHT's best-selling ProColor is the choice of hundreds of our Fortune 1000, Government and Higher Education customers, like YOU!

**PROCOLOR 1300. \$2,999**

- ◆ 16.8 million color palette
- ◆ Lightweight, reliable and rugged design
- ◆ PC/Mac compatible upgradeable to video
- ◆ Multimedia model 1500 only \$3,799!



No one else offers the one-stop shopping...the selection... the value...the immediate delivery... and the knowledgeable service and support you get from the projection panel experts.

The Inc. 500 logo is a registered trademark of Goldhirsh Group, Inc.

**BOXLIGHT CORPORATION**

17771 Fjord Dr. N.E., Poulsbo, WA 98370 • 206/779-7901  
Payment: VISA, MasterCard, American Express, COD and  
Purchase Orders (some restrictions). Leasing and rental  
options available. 30-Day Money-Back Guarantee.



**Call today 1-800-762-5757**

**Government Sales 1-800-497-4009  
Reseller Sales 1-800-736-6916**

### Enterprise Software

**How many products does it take to manage customer service in your data center?**



**More than one?**

What would your customers say if you installed one software product that could:

**Present** your service solution across any platforms you choose;

**Automate** your system facilities to communicate with your enterprise management solution;

**Integrate** your service desk, problem, change, and asset management disciplines; and--

**Distribute** your data and applications across popular non-proprietary, relational databases?

How about, "Thank you."

ASG announces **ASG-IMPACT™** and **ASG-IMPACT/LAN™**, today's only totally integrated customer service, enterprise management solution.

Call your ASG sales and service representative today for details.

**1-800-932-5536. Ext. 411.**

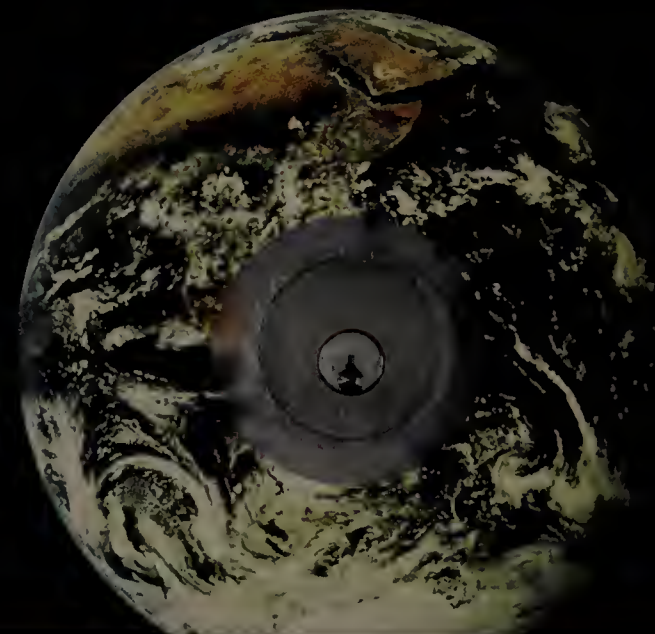
**OS/2  
UNIX  
Windows  
Windows NT  
Mainframe**



**ALLEN SYSTEMS GROUP**  
Customer Service for the Enterprise

Offices: Naples, FL Atlanta Boston Sydney Paris Tokyo Amsterdam Singapore Bristol U.K.  
Copyright 1995 Allen Systems Group, Inc. All products named herein are trademarks of their respective holders.

### Network Security & Wireless Bridges



## Cylink has the world locked up.

You can secure your information globally. You just need the right security partner. Only Cylink has spent the last ten years building a support organization in over 80 countries—working successfully with local governments, customs, and communications infrastructures. We can secure everything from applications on a laptop to global wide-area networks, from telephones to high-speed data links. We secure information for most of the world's money center banks, Fortune 500 companies, and government, police, and military organizations. Because of our experience, it's easier than you think to keep your information safe. Cylink Corporation, 910 Hermosa Court, Sunnyvale, California, USA, 94086. Telephone: 408-735-5800, FAX: 408-720-8294, Toll-free (USA): 800-533-3958. Worldwide sales & support. FAX INFO: 800-833-9137 ext. 63.



England: Cylink, Ltd., Hampshire—TEL: +44-256-841919 • FAX: +44-256-24156  
Singapore: Cylink Corporation—TEL: +65-336-6577 • FAX: +65-334-1429  
© 1994 Cylink Corporation. Cylink is a registered trademark of Cylink Corporation.

**CYLINK**



# TCP/IP Applications For Windows.

## Network Your PC To The World With Chameleon.

### BEST VALUE

Chameleon offers more applications than any other product, providing a comprehensive Windows solution for TCP/IP networking.

### SEVEN INTEGRATED SUITES

Terminal emulation, e-mail, file and printer sharing, remote access, network utilities, administration tools, and an easy point-and-click interface into the Internet.

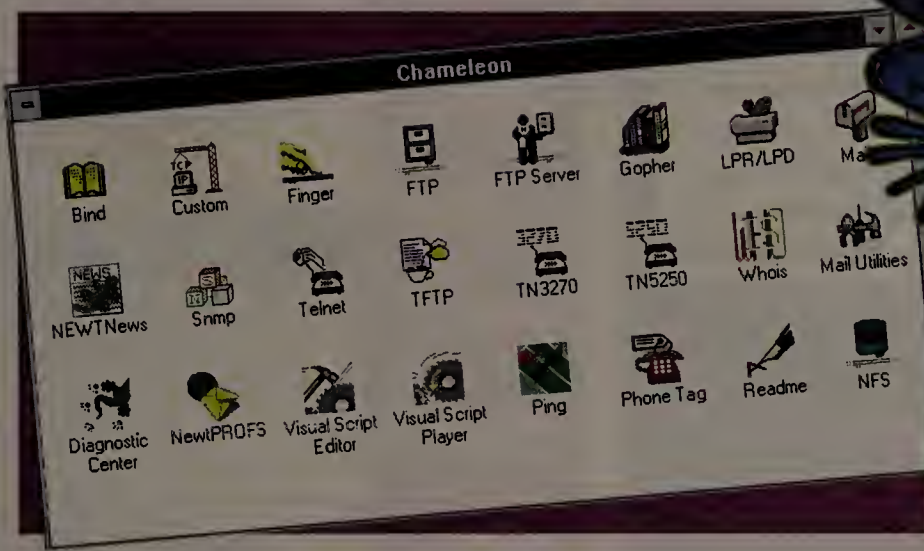
### SEAMLESS ACCESS TO OTHER

**HOST SYSTEMS** More applications are included that allow you to access information on Unix mainframes, minicomputers, PC-based LANs and WANs, and the Internet.

### OFFICE, HOME, AND REMOTE NETWORK ACCESS

Connect to your network and the Internet via LAN or dialup access with one easy-to-use software package.

Chameleon includes WinSock TCP/IP and is 100% DLL. It requires only 6KB memory and 5 minutes to install.



### APPLICATIONS INCLUDED:

- Terminal Emulation
  - Telnet: VT100, VT200, TVI, TN3270, TN5250
  - Visual Script Editor & Player
- File Transfer
  - FTP Client & Server
  - TFTP
- File & Printer Sharing
  - NFS Client & Server
  - LPR/LPD
- Electronic Mail
  - SMTP Mail with MIME
  - Phone Tag
  - IBM PROFS
  - POP2, POP3, SMTP
- Internet Access
  - Gopher
  - Newsreader
  - Whols
- Network Utilities
  - Ping
  - Finger
  - Diagnostic Center/Trace Agent
  - DNS Client & Server
- WinSock TCP/IP
  - 100% DLL TCP/IP Stack
  - Windows install and setup
  - LAN: Ethernet, Token Ring
  - Dialup: SLIP, CSLIP, PPP & ISDN



© 1994 NetManage Inc., 10725 North De Anza Boulevard, Cupertino, California 95014, U.S.A.  
Fax: (408) 257-6405. Specifications are subject to change without notice. All trademarks are property of their respective companies.

## NETMANAGE™

(408) 973-7171

e-mail: sales@netmanage.com

World Wide Web: www.netmanage.com

► See Us At CeBit Booth # M9-M10

Network Management

Computer Presentation

## AutoBoot Technology in a New 'Slimmer' Size!

- Control up to 96 file servers with just 1 keyboard, monitor and mouse
- AutoBoot™ feature boots all computers without user intervention
- 1.75" unit fits into your computer rack using a minimum of space
- Push-button and keyboard controlled scanning standard
- Control all computers locally, remotely, or both
- Supports all 100% IBM compatible PCs and PS/2 or serial mouse; optional Macintosh and Sun support available
- Rear peripheral access available



**SLIMLINE™**  
**COMMANDER™**



Cybex Corporation  
4912 Research Drive Huntsville AL 35805 USA  
(205) 430-4000 (205) 430-4030 fax

IBM is a trademark of International Business Machines Corporation. Macintosh is a registered trademark of Apple Computer, Inc. Sun is a trademark of Sun Microsystems. Cybex, Commander, AutoBoot and Slimline are trademarks of Cybex Corporation.

Made in USA

## Power Tools for the Power Presenter

One stop shop for all major brands



SALES • LEASES • RENTALS

COLOR from \$1,795

For the latest in color projection panels and projectors call the experts in LCD technology. Your satisfaction guaranteed or your money back. Quick delivery via Fed-X or UPS.

## Call for CATALOG 1 800 726 3599



101 The Embarcadero Ste. 100-A, San Francisco, CA 94105  
Hours: 6:30 to 5:30 PST, 9:30 to 8:30 EST  
VOICE: 415 772 5800 FAX: 415 986 3817



# Buy / Sell / Lease - Services

Buy / Sell / Lease

**BUY • SELL • LEASE • RENT**

**IBM Systems • Peripherals • Parts & Service**

**SPECIALIZING IN:**

- ▶ RISC System/6000®
- ▶ Workstations
- ▶ Parts & Features
- ▶ AS/400®
- ▶ Novell Networking
- ▶ Sun & Dec
- ▶ Personal Computers
- ▶ Data Communications
- ▶ UPS Systems
- ▶ Peripherals & Upgrades
- ▶ System 36 Conversions
- ▶ AutoCad

**NEW & USED IN STOCK**

Complete Technical Center, Installation, Stock Parts & Features for RISC.

*Authorized Distributors for:* Seagate • Xerox  
Kingston • Cal Comp  
Motorola • UDS/Codex  
Decision Data Products

8 Nationwide Locations

*A Publicly Traded Company  
NASDAQ: MKPL*

*Computer Marketplace prides itself on being your one-call computer hardware solution.*

**COMPUTER MARKETPLACE**

**800-858-1144**

TEL (909) 735-2102 • FAX (909) 735-5717  
1490 Railroad Street • Corona, CA 91720

as cd
® IBM Trademark
CDLA
CBE

Large Systems Computers & Peripherals

- ES/9000
- SERIES/1
- AS/400
- RS/6000
- SYSTEM/88
- Point Of Sale
- ...and more!

New & Used

- **Computers**
- **Peripherals**
- **Upgrades**

Buy • Sell • Rent • Lease

**SPECTRA**  
(800) 745-1233  
(714) 970-7000 • (714) 970-7095 Fax

Anaheim Corporate Center  
5101 E. La Palma Ave., Second Floor  
Anaheim, CA 92807

**amdaahl**

Cisco

Concurrent

Data General

**digital**

Hitachi

HEWLETT PACKARD

Memorex-Telex

**Prime**

Silicon Graphics

**Stratus**

Sun

TANDEM

TEXAS INSTRUMENTS

**UNISYS**

**XEROX**

Systems & Services

## Dempsey: Where IBM® Quality is Second Nature!

- AS/400
- INDUSTRIAL PC
- RS/6000
- SYSTEM/36
- SERIES/1
- 9370
- ES/9000
- PS/2 & VP

**Sales & Rentals**

- Processors
- Peripherals
- Upgrades

For pretested equipment, flexible financing, configuration planning, technical support and overnight shipping call.

18377 Beach Blvd., Suite 323 • Huntington Beach, CA 92648  
(714) 847-8486 • FAX (714) 847-3149

**IBM**

Authorized Distributor Products Integrator

IBM is a registered trademark of International Business Machines Corporation.

## (800) 888-2000

Buy / Sell / Lease

## WE BUY

Data General Avilion  
Data General MV  
Data South  
Data Products  
RS/6000  
HP 9000  
SUN  
PCs/Workstations  
**and we sell it too!**

**(617) 982-9664**

Trading

Fax (617) 871-4456  
BLASS@SHORE.NET

Used Equipment & Deinstallation

## Buy, Sell, Deinstall

- Purchase of used mainframe systems and peripherals
- Deinstallation Services

**Wanted to Buy**

• 308x	• 3420
• 3370	• 3422
• 3380	• 3480
43xx	53xx

914-427-2151 Fax: 914-427-7791

Electronic Resource Recovery  
PO Box R • Henry Henning Dr.  
Maybrook, NY 12543-0316  
Contact: Bob Hewitt

Outsourcing / Remote Computing

X

Your best choice for mainframe computing services.

## OUTSOURCING REMOTE COMPUTING

**Extensive Software Library**

Telenet Tymnet  
Advantis Compuserve

MVS/ESA	IMS/DBDC
VM/ESA	CICS SAS
VSE/ESA	TSO DB2

Extraordinary Customer Service  
Migration Management

708-574-3636  
New England 617-595-8000  
815 Commerce Drive, Oak Brook, IL 60521

## FANEUIL SYSTEMS



Outsourcing

## If Outsourcing is your objective...

You can maximize your information technology investment by outsourcing part – or all – of your IS operation. Whether it's a transitional or long-term total services partnership, American Software's the right place to rightsize.

Even software developers enjoy the cost and time-saving benefits of outsourcing with us. Call today and we'll tell you why.



### ® The Outsourcing Group

A Unit of American Software USA  
470 E. Paces Ferry Road  
Atlanta, GA 30305  
404-264-5770

**The Business Charter.** Marketing itself as "The Boutique of the Computer Services World" and operating on a platform of excellence, ALICOMP, INC. focuses on providing personalized outsourcing and remote computing services to domestic and international clients with specific IBM mainframe needs.

**The Results...Bottom Line.** "Computerworld Marketplace advertising definitely gets the right companies to call. We consistently receive top-quality leads and typically convert over 10% into sales contracts. So we know the ALICOMP name is being seen by our profile companies. With 14 years in the business, we've tested our share of advertising sources, and there's no comparison. Clearly, Computerworld Marketplace is the place to advertise. For over two years now, running an exclusive schedule in Computerworld Marketplace every week has proven to be one of the best ways to maximize ALICOMP's business potential."

Arthur Kurek, President  
Lorraine Drake, Executive Vice President  
ALICOMP, INC., Manhattan NY/Secaucus NJ

Where Buyers Meet Sellers -  
Every Week 1-800-343-6474, ext. 744

**COMPUTERWORLD  
Marketplace**

Outsourcing / Remote Computing



The "Boutique" of the Computer Services World

**Outsourcing Remote Computing**

VM, MVS, VSE

**Two State of the Art Locations:**

ALICOMP / CBS

20,000 sq. ft. Manhattan complex 105,000 sq. ft. Secaucus, NJ complex

"Our Platform is Excellence"

Serving Clients Since 1980

(212) 886-3600 • (800) 274-5556

Outsourcing / Remote Computing

Outsourcing/Remote Computing

**CONSULTEC**  
INC.

Whether its Transitional or  
Long Term Outsourcing,  
we invite you to see why  
Consultec is  
**The Logical Choice**

MVS/ESA-CICS-TSO-DB2-IMS

Contact: Carey Gibson  
1-800-358-2381 ext.330  
in GA. 404-594-7799

9040 Roswell Road Atlanta, GA 30350

What's the Best-read Newsweekly  
among IS Professional?

**Simmons  
Says...  
Computerworld.  
Again!**

Call for Complete Details!  
**Computerworld Marketplace**  
Call 1-800-343-6474,  
ext 744

# Attention IS Professionals

Find out where the money is!

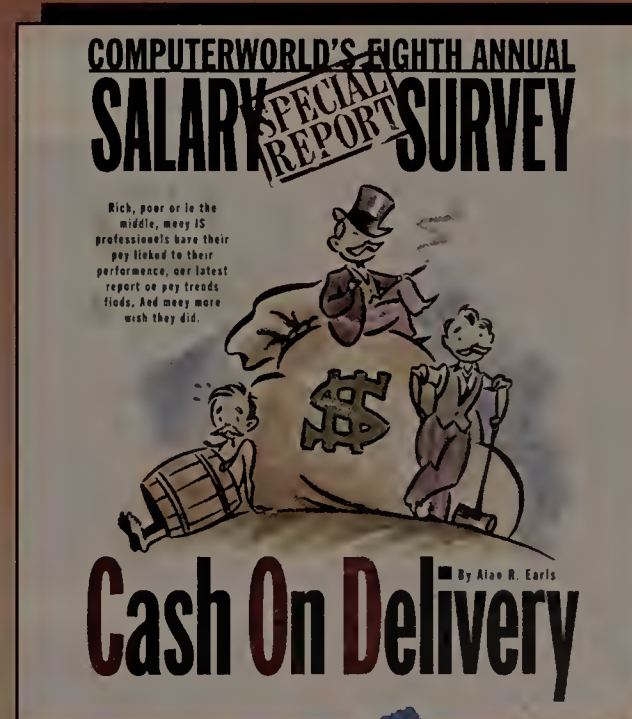
**Computerworld's 1994/1995 Salary Survey** disk is just what you need to get an inside look at what professionals are getting paid

Get the facts on:

- Salaries in 28 IS specific job titles
- Salaries in 21 industries
- Salaries by geographic regions - not published anywhere else

Call to order **Computerworld's Salary Survey** on disk today.

**ONLY  
\$99**



**Call toll-free 1-800-495-0157, ext. 10**



# Classified Solutions

## BIDS / PROPOSALS

### MS CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by CDPA, 301 N. Lamar St., 301 Bldg, Suite 508, Jackson, MS 39201 for the following:

**RFP 2693** due Monday, April 3, 1995 @ 3:30 P.M. for the initial acquisition, installation, configuration, testing and maintenance of 56 low-end peripheral routers, five high-end, internetwork, multiprotocol backbone routers, and one ATM switch. This RFP will be used to establish the router standard for the State of Mississippi, State Computer Center State-wide Backbone Network. No Charge. A mandatory bidder's conference is scheduled for Thursday, March 23, 1995 @ 10:00 A.M. to be held at the offices of the Central Data Processing Authority located at 301 North Lamar Street, Suite 508, Jackson, MS 39201.

Vendors may request RFPs with no charge by calling Linda Watkins at (601) 359-2604. CDPA reserves the right to reject any/all bids and to waive informalities.

## BIDS / PROPOSALS

### METROPOLITAN TRANSPORTATION AUTHORITY NOTICE

is hereby given that the Authority will receive sealed bids for Furnishing and Delivery of Personal Computers and Peripheral Equipment as indicated below, on which date they will be opened at the indicated time at the Authority's offices at 347 Madison Avenue, New York, NY 10017 (5th floor). Bids must be submitted on the form provided by the Authority. Copies of such forms may be secured from Ms. Jean Benning, Systems Administrator, Procurement Services, Metropolitan Transportation Authority, 347 Madison Avenue, New York, N.Y. 10017-3739 or by calling (212) 878-7209.

**INQUIRY:** 5-01-95023-0  
**DATE:** 4/5/95  
**TIME:** 3:00 P.M.

**FOR:** Furnish and Deliver Personal Computers and Peripheral Equipment on an As-Needed Basis for a Period of Two (2) Years to MTA and its Constituent Agencies.

## OFFSHORE SOFTWARE DEV

### COSTA RICA - "A BETTER WAY"

Low-cost, hi-quality offshore programming, Central Time Zone, 3 hour flight from USA. Satellite Links. Oracle, Visual Basic, Powerbuilder, Sybase, C++, COBOL, AS400.

**Hestair, Houston . . . . (800) 448-7277**

## REMOTE COMPUTING

ALICOMP provides short and long term mainframe remote computing services to companies who require VM, VSE, and/or MVS. Pricing and contracts are tailored to the unique requirements of each client. Client intimacy is our hallmark.

**ALICOMP, Inc.**  
(800) 274-5556 (212) 886-3600  
(See Our Ad in the Marketplace)

## CONSULTING

**BRIDGTON INC. 800-305-6478 404-518-4289**

OPERATING SYSTEMS	DATABASE
UNIX	SYBASE
MS WINDOWS	ORACLE
MS-DOS	DB2
OS/2	XDB
MVS	

LANGUAGES	EQUIPMENT
C, C++	IBM RS 6000
COBOL II	IBM PC (COM-PATIBLE) POWERBUILDER
VISUAL BASIC/VISUAL C++	IBM MAINFRAME
REXX	DATA GENERAL HP 9000
CICS/DB2/VSAM	
FOXP, CLIPPER	

CASE TOOLS	SERVICES
ADW 1.6/2.7	CONSULTING
ADW CWS GUI	TRAINING
OBJECTVIEW	OUTSOURCING
IEF	

## OUTSOURCING

**ISO 9001 CERTIFIED OFF-SHORE/ON-SITE SOFTWARE SERVICES**  
Substantial cost savings on Development, Maintenance, Conversion, Rightsizing using Indian facility with in-house IBM 9000, AS/400, RS 6000, SUN and CICS, DB2, IMS, COBOL, RPG, SYNON, Oracle, Sybase, Visual Basic, Powerbuilder, Uniface, C++.

**D Square Software, Inc.**  
Tel: (908) 632-2688 Fax: (908) 632-2692

## OUTSOURCING

**FANEUIL SYSTEMS** provides mainframe based Outsourcing and Remote Computing Services for well over a decade. Our reputation for providing high quality services in a flexible and cost effective manner is undisputed in the industry. Join the many others who have already made the right choice, call FANEUIL SYSTEMS at (708) 574-3636. (See Our Ad in the Marketplace Section)

## OUTSOURCING

**FINANCIAL TECHNOLOGIES COMPUTER SERVICES DIVISION**  
(703) 631-4401  
**OUTSOURCING - REMOTE PROCESSING**  
Multiple IBM ES9000 Mainframes  
MVS/ESA VM/ESA  
Current Software Releases,  
7 days/week, 24 hours/day  
Quality Service - Competitive Pricing

## 401(K) ADMINISTRATION

**DELTA DATA SOFTWARE, INC.**  
(800) 451-9188  
Defined contribution administration software for the plan sponsor. Interfaces with payroll to administer 401K, ESOP, thrift, and profit sharing plans. Daily or periodic processing, distributions, loans, ADP/ACP testing. User defined statements, voice response. Runs on AS/400 and PC.

## ACCOUNTING

**M • A • S 90 EVOLUTION/2 Accounting Software at Discount Prices?**  
Pay **DISCOUNTED** prices for the premier accounting solution. Industrial strength G/L, A/P, A/R, Payroll (with multiple city/state taxation), J/C, P/O, Sales Order, Point of Sale, Inv Mgmt, Time & Billing, many others.  
Dos/Windows/UNIX platforms supported.  
**CORLOR Development, Inc. (505) 281-7151**

## APPLICATIONS CONVERSION

**AUTOMATED CONVERSION SPECIALISTS**  
DOS to MVS HONEYWELL to IBM  
MACRO to COMMAND CSP to COBOL/CICS  
RPG to COBOL COBOL to COBOL II  
PL/1 to COBOL CENTURY EXPANSION  
Other Platform/Language Conversions  
**BELCASTRO COMPUTER SERVICES, INC.**  
800-521-2861 216-652-1628

## EDUCATION & TRAINING

**Visual Basic, C++, OOA-OD, ORACLE Texas Software**  
(800) 252-7007

## ELECTRONIC DOCUMENTATION

Assistance in Standard Generalized Markup Language. Concept development, requirements, documentation analysis, document type definitions, training, technical architecture, conversion, document viewing. Automate document preparation, reuse content in new ways.  
**Waysys, Inc. .... 800-622-5315**

## ELECT. DATA INTERCHANGE

**EDI software, consulting, & Integration**  
Next Edition, Inc. 14+ yrs exp  
(216) 498-0602

## APPLICATIONS DEVELOPMENT

**Tired of maintaining your legacy applications? LPC (800) 624-5377**

## BUSINESS CONSULTING

**KRESIC & MAZZONE INTERNATIONAL**  
Twenty years experience in international and domestic technology transactions, advising on hardware and software agreements, OEM, strategic alliances, joint development projects and protection, use, licensing and transfer of intellectual property.  
For more information call  
(203) 431-9204 or fax (203) 431-1945.

## C++

**C++ and Object Technology Training**  
5-day, on-site seminars on C++, Visual C++, Borland C++, OOA/OOD, Visual Basic, and C. We customize our courses to your needs. Contact us today for course outlines and pricing.

**DEITEL & ASSOCIATES**  
deitel@world.std.com  
Phone: (508) 877-0273 FAX: (508) 788-0937

## CLIENT/SERVER DEVELOPERS

**Re-Engineer NOW!!!**  
Let our highly motivated professionals help your corporation make the successful transition from your existing mission critical applications into object-oriented client/server systems. Powerbuilder, C/C++, Visual Basic, Sybase/Oracle/Informix, Imaging, Wireless, ISP.  
**Innovative Information Technologies, Inc.**  
1-800-352-2797

## DATA WAREHOUSING

### The Data Warehouse Experts

Looking for a company with years of experience in true Data Warehouse implementation? Look no further! Let Solveris help unlock the power of your information system!

**Solveris Inc.**  
(800)-999-4829

## DATA WAREHOUSING

**Will your warehouse misfire from bad data? The Integrity Data Re-engineering Tool** transforms legacy data, saddled by account and department orientations, into consolidated views of customers and the business. Request: paper detailing 5 legacy data contaminants you will encounter & stories on firms solving their data migration problems.

**Vality Technology, Inc. 617-338-0300.**

## EDUCATION & TRAINING

**Information Security Training & Publications**  
CSI Membership includes: monthly newsletter, buyers guide, journal, training discounts, hotline, networking, more. Seminars, conferences. June Network Security Conference in New Orleans. For free sample newsletter and information:  
Fax (415) 905-2218. CSI, 600 Harrison St. SF, CA 94107. phone (415) 905-2626, e-mail: prapalus@mfi.com.

## EDUCATION & TRAINING

**Millennium Computer Corp. "Quality Solutions" On Schedule, Within Budget**  
(716) 248-0510

## OFFSHORE SOFTWARE DEV

**Serving the Northwest USA**  
• Providers of quality software development. Options for Joint Venture. Services:  
New Development Re-engineering  
Migration Client-Server/PC/RDBMS  
Testing/OA Product Enhancement  
**LINCROSS SOFTWARE SYSTEMS, INC.**  
(206) 236-5847  
INDIA • SINGAPORE

## OUTSOURCING

ALICOMP and CBS Data Services, in its business alliance, offers the highest level of technical, operational, and managerial expertise within a single mandate: loyalty and the highest quality computer services with flexible pricing to our client/partners.

**ALICOMP/CBS**  
(800) 274-5556  
(See Our Ad in the Marketplace)

## OUTSOURCING

**Outsourcing/Remote Computing IBM, MVS/ESA**  
Transitional Outsourcing  
Specializing in high online transaction environments, Multiple mainframes, Reasonable prices  
Consultec, Inc.  
Contact: Carey Gibson  
(800) 358-2381 ext. 330

## REMOTE COMPUTING

**FANEUIL SYSTEMS** provides mainframe based Outsourcing and Remote Computing Services for well over a decade. Our reputation for providing high quality services in a flexible and cost effective manner is undisputed in the industry. Join the many others who have already made the right choice, call FANEUIL SYSTEMS at (708) 574-3636.  
(See Our Ad in the Marketplace Section)

## RIGHTSIZING

**MCRB Service Bureau, Inc. 3090**  
Computer Services (800) 941-MCRB

## SOFTWARE REENGINEERING

**Reuse Your Existing Software Assets**  
• Computer language translation and migration reengineering services converting into C, C++, Ada, and COBOL  
• Services guaranteed for: functionality; maintainability; price; delivery date.  
• Language and platform independent  
**Alydaar Software Corporation:**  
(504) 845-3322

## SOFTWARE REUSE

**RPM™ "NEW"**  
**Reuse Process Manager™**  
The One and Only Process Manager That Combines C/C++, C/S and P/Share  
A windows-based process manager tool with a fully customizable reuse-based, Object-oriented OO methodology for defining and managing the development of C/S applications.  
Developed by Dr. Carma McClure  
**Extended Intelligence, Inc. (312) 246-5245 x360**

## WORKFLOW APPLICATION SOFTWARE

**Commerce Software, Inc.**  
(PurchaseSQL™) Elmsford, NY  
(800) 447-7172

## OFFSHORE SOFTWARE DEV

**Hexaware Technologies - A Blue Chip Resume:**  
• **Client/Server** technology focus  
• **Oracle, Sybase**  
• **Powerbuilder, Uniface, Visual Basic**  
• Complete Turnkey responsibility  
• Virtual: 64 kbps data link from your office to India  
• State-of-the-art software development center in India....  
• Large pool of quality software talent  
• International quality standards  
• Success stories in US/Middle East/India  
• Joint Venture option  
Tel: (609) 951-9195; Fax (609) 951-9638  
*Partner for Success*  
**Hexaware Technologies, Inc.**  
Princeton • Bombay • Bahrain • Dammam

## CLIENT/SERVER DEVELOPERS

**Millennium Computer Corp. "Quality Solutions" On Schedule, Within Budget**  
(716) 248-0510

**"Hexaware Technologies Inc. found the Solutions Section advertising extremely effective. It opened doors to fortune 500 companies and client/server software development opportunities in an amazingly swift manner. We will advertise again."**

**V. Krishnaswamy**  
President  
**Hexaware Technologies Inc.**

**COMPUTERWORLD Marketplace**

## CONSULTING

**SAVE 50%-70% ON PROGRAMMING**  
While using some of the most sophisticated programmers in the world. All customer contact handled in the U.S.  
• Client Server  
• New Application Development  
• Updating & Porting to New Platforms  
**Typhoon Software, Inc.**  
800-499-0888

## DATA RECOVERY

**RANDOMEX Data Recovery Service**  
Hard Drives - Tapes - Floppies - Disk Packs  
Crashes/Power Failures/Viruses/Fire  
Average Turnaround 72 Hours  
98% Success Rate On Recoverable Data  
14 Years Experience • 23 Operating Systems  
800-726-3669 (Long Beach, CA)  
800-466-0893 (Boston, MA)

## FAX COMPUTER INTEGRATION

Improve customer support & contain its cost. Increase sales & advertising results. Get **Fax-On Demand, The Marketing Tool of the '90s**, industry's leading resource on computer-fax applications. More by fax at 408-243-2275

**ABCConsultants (800)-982-3715**

## I/T CONSULTING

**MAINFRAME SOFTWARE SUPPORT SERVICES**  
OPERATING SYSTEM MIGRATION, PERFORMANCE TUNING, DATABASE, PROGRAM PRODUCT SUPPORT DATA MANAGEMENT, CICS, DB2, IMS, NCP, VTAM AND MANAGEMENT CONSULTING

**CAMERON OF ATLANTA, INC.**  
(800) 331-7635

## OUTSOURCING

**MCRB Service Bureau, Inc. 3090**  
Computer Services (800) 941-MCRB

## PC SOLUTIONS

**Micro Focus COBOL, Dialog System, Panels2 solutions. Next Edition, Inc**  
(216) 498-0602

## COMPUTER/TEL INTERGRATION

**Computer/Telephone Integration**  
Consulting & Design.  
Expert guidance for the medium to large call center environment. ANI/DNIS routing - Call/Data-screen synchronization - Caller Profile call routing. Functional Specifications-Design-Documentation.  
**Get it right the 1st time!**  
**INSIGHT SERVICES 1-800-877-9024**

## CONTRACT PROGRAMMING

**PC programming, DOS/WINDOWS \$30/hr. Courseware App (612) 854-8909**  
Fax (612) 854-1868



Microsoft Solution Providers are independent organizations that provide consulting, integration, development, training, technical support or other services with Microsoft products. Microsoft Solution Providers implement business solutions for companies of all sizes and industries by taking advantage of today's micro-computer technology for graphical and client-server applications

For complete listing of Microsoft Solution Providers Call (800) SOL-PROV

# Microsoft®

## SOLUTION PROVIDER DIRECTORY

### ADVANCED SYSTEMS TRAINING

**Hilton Computer Strategies**  
6001 Savoy #207  
Houston, TX 77036

Hilton Computer Strategies is the premier training facility in Houston for advanced systems training in Windows NT, Windows 95, Systems Management Server, and soon Information Exchange. Call 1-800-324-7415 for complete information.

### ADVANCED TRAINING/CONSULTANT

**Network Services Group, Inc.**  
8275 Allison Pointe Trail, Suite 375  
Indianapolis, Indiana 46250-4207  
Phone: (317) 579-5806 Fax: (317) 579-5807  
E-Mail: 75361.3151@compuserve.com

NSG is Indy's NT networking leader. The "sales staff" is our team of Microsoft Certified Instructors/Engineers focused on enterprise solutions. Instructors are on-site consultants when not giving ATEC training.

### CLIENT/SERVER

**COROMANDEL INDUSTRIES, INC.**

70-15 Austin Street, Thld Floor

Forest Hills, NY 11375

Phone: 800-535-3267 Fax: 718-793-9710

Leading developer of Client/Server products like Integra VDB. Services include design and custom development of cross-platform, graphical applications using C++, Visual Basic, Microsoft Office, BackOffice, NT, OLE and SQL databases.

**Hummingbird Communications, Ltd.**

2900 John Street

Markham, Ontario, Canada L3R 5G3

Phone: (905) 470-1203 Fax: (905) 470-1207

Hummingbird offers the most comprehensive, robust PC X connectivity product line available today. The eXceed product family is comprised of PC X software for Windows, Windows NT, OS/2 and DOS.

**Jinks Technology Management**

Phone: (603) 888-0070 Fax: (603) 888-3444

Planning and Development assistance for Windows and Client/Server applications throughout New England. Staff includes Microsoft certified System Engineer and Product Specialists.

**RRTC, Inc.**

1-800-476-4454/Fax: 804-295-3291

Authorized Technical Education Center (ATEC). Microsoft certified training for support professionals. Washington, D.C. and Richmond, Virginia. On-site training available. Classes in NT, NT Server, SQL, SMS, Windows 95, Mail. Serving Customers Nationwide

**SOLARC (800) 665-0883**

Offices in Tulsa & New Orleans

We specialize in developing both departmental and enterprise wide client/server solutions, and provide consulting and training for: Microsoft NT Visual Basic SQL Server Visual C++

**Unibased Systems Architecture, Inc.**

14323 So. Outer Forty Rd., Ste. 300 South

St. Louis, MO 63017

Phone: 800-489-6069 Fax: (314) 878-2674

Providing migration of large scale legacy applications to a three tier client/server environment. USA's layered RAD tool (A\*SET) provides RDBMS independence, generating standard C code for use with Win 95 and NT server

### CONSULTING

**Carnegie Technology Group, Inc.**

1266 W. Paces Ferry Rd, Suite 508

Atlanta, GA 30327

Phone: (800) 499-7624 Fax: (404) 988-9889

We are recent PhD's from top schools including Carnegie Mellon, MIT, Georgia Tech. We specialize in solving complex problems using Visual C++, Visual Basic, Smalltalk, SQL Server, and ODBC.

**Computermart of Georgia, Inc.**

7274 Mount Zion Blvd.

Jonesboro, GA 30236

Phone: (800) 887-5105 Phone: (404) 478-5681

Fax: (404) 473-1726

Contract programming, consulting service & software development. Specializing in all industries & most applications. 17 years in business, diverse programming capabilities, multi-platform & a list of satisfied customers.

**DHS & Associates, Inc.**

10255 W. Higgins Rd., Suite 800

Rosemont, IL 60018

Phone: (708) 297-5600 Fax: (708) 297-5607

At DHS & Associates, we design and build practical information systems enabling our clients to anticipate and respond to rapidly changing business environments.

**DIS Research Ltd**

1500 Broadway, 31st Floor

New York, NY 10036

Phone: (212) 719-9696 Fax: (212) 382-24852

DIS Research is a full service desktop systems integrator serving the business community for the last ten years. With specializations in LAN, WAN design and implementations, systems support and applications development DIS maintains the depth and breadth of services needed to meet all your computing needs.

**Navigist**

Sunnyvale, CA (408) 744-1760

Colorado (303) 290-0232

Emphasizing Client/Server, messaging and connectivity technologies, Navigist designs, implements, and supports robust LANs/WANs. A service oriented organization, Navigist will be an extension of your IS staff.

**NewData Strategies**

16415 Addison Road, Suite 500

Dallas, TX 75248

Phone: (214) 735-0001 Fax: (214) 735-8008

Client/Server and RDBMS Solutions. NewData Strategies offers Training and Consulting in Microsoft products and major Client/Server and DBMS Tools. We employ Certified PowerBuilder Developers and Microsoft Specialists.

**Pyramid Computers**

90 Fifth Ave #4

Brooklyn, NY 11217

Phone: (718) 398-4626 Fax: (718) 230-5539

Access and Visual Basic consulting. We specialize in troubleshooting and one-on-one training. Experienced developers available for challenging applications. We also offer Microsoft Office integration, SQL Server, and Windows NT support.

**Synaxis Corporation**

Contact: Sam Levine (Sam@Synaxis.COM)

617-449-4400 x140

Technical Competence!

Expert Application Development using Visual Basic. Focus on Imaging and E-Mail. Database Analysis, Design, and Development for Access, SQL-Server, and others. Customized Visual Basic Front-ends and Development for Lotus Notes.

**Taylor Management Systems, Inc.**

2800 River Rd Ste 425

Des Plaines, IL 60018

Phone: (708) 803-1500 Fax: (708) 803-1509

EMAIL: carl@taylorlormgmt.com

Taylor is among the 25 largest consulting firms in Chicago. As a Microsoft Business Partner, we specialize in Microsoft solutions development, Mainframe to Client-Server conversions and statistical analysis using SAS.

**SQLSoft, Inc., 10635 NE 38th Pl., Ste. 24B, Kirkland,**  
WA 98033; phone: (206) 822-1287; fax: (206) 822-1485

**Virtual**

Phone: (301) 571-9476 Fax: (301) 571-8530

6701 Democracy Blvd., Suite 300

Bethesda, MD 20817-1574

Professionals with the skills you seek — where needed — when needed. On-site developers, DBAs or complete teams skilled in MS development tools, PowerBuilder, MS BackOffice, Sybase and Oracle. Contact Mark Rogers.

### CUSTOM SOFTWARE DEV.

**InfoDesign Inc.**

108 Davenport Lane, Suite 101, Louisville, KY 40223 (502)

339-7144 (voice) (502) 339-7194

**Personal P.C. Consultants, Inc.**

Phone: (402) 393-4548; Fax: (402) 392-0711

### DATABASE DESIGN/DEV

**Professional Computer Solutions, Inc.**

383 Nordhoff Place, Suite 100

Englewood, NJ 07631

Phone: (201) 816-8002 Ext. 136 Fax: (201) 816-8113

PCSI focuses on developing database applications using Access, Visual Basic, Paradox, Microsoft SQL Server, Sybase, Oracle, and other products. We also perform technology planning, requirements analysis, architecture, and performance benchmarking.

**Quantum Compliance Systems, Inc.**

4251 Plymouth Rd.,

Ann Arbor, MI 48105

Phone: (313) 761-21752 Fax: (313) 761-3058

Environmental, Health & Safety Information Management Systems to assist with compliance with SARA, RCRA, CAA, TSCA, OSHA, CERCLA, DOT, and other regulatory requirements.

### EDUCATION

**UCI Corporation**

6030 South Vivian Street

Littleton, CO 80127

Phone: 800-732-0333 Fax: (303) 933-4607

Specializes in providing high-end Microsoft Education Services courses for developers, system engineers, and IS professionals. Call to request a catalog of scheduled classes or more information.

**UCI Corporation**

92 Montvale Avenue

Stoneham, MA 02180

Phone: 800-884-1772 Fax: (617) 279-2574

Specializes in providing high-end Microsoft Education Services courses for developers, system engineers, and IS professionals. Call to request a catalog of scheduled classes or further information.

### END-USER TRAINING

**EEL**

66 Canal Center Plaza, Suite 200

Alexandria, VA 22314-5507

Phone: (800) 683-5859 / (703) 683-0683 Fax: (703) 683-4915

Training, development, and consulting for Microsoft Access, Windows, Word, PowerPoint, and Excel. Multimedia development and training for Windows and Mac: Director, Toolbook, Premiere—also Photoshop, CorelDRAW, QuarkXPress, Illustrator, PageMaker, Framemaker.

Get ready for Win95 NOW at MS ATEC reSolution

(212) 255-1956

### E-MAIL MANAGEMENT

**Baranof Software Inc.**

85 School Street

Watertown, MA 02172

Phone: (800) 462-4565 Fax: (617) 926-6636

Leading provider of E-mail Management products, including MailCheck - multivendor graphical console providing end-to-end connectivity checking, error-levels, alerts, statistics, more! Call Kelly Walters for FREE demo!

### EDUCATION

**CheckPOINT 17240 22nd Street, Oakbrook Terrace, IL**

60181. Phone: (708) 279-9030/fax: (708) 279-6359.

### INDUSTRIAL AUTOMATION

**C.B. Engineering Ltd**

#20, 5920-11 Street SE

Calgary, Alberta, Canada T2H 2M4

Phone: (403) 259-6220 Fax: (403) 259-3377

CB Engineering represents industrial automation suppliers which include Intellution, Inc. (SCADA/MMI software) and IBM (Industrial Computers, Monitors, and Data Collection Units). Located in seven major Canadian cities, call 1-800-99CBENG (1-800-992-2364).

### LINE/BUSINESS SOLUTIONS

**Granitek Systems, Inc.**

Meredith Sq. #10

169 Rt. 3, Daniel Webster Hwy.

Meredith, NH 03253

Phone: (603) 279-1200 Fax: (603) 279-1201

SALES PARTNER - Integrated Sales and Prospect Management in Microsoft Access for Windows or Windows NT. Sales Force Automation with links to Word, Excel, Great Plains, Dynamics and Micro-MAX MRP.

**Information Processing Corporation**

5930 LBJ Freeway, Suite 300

Dallas, TX 75240

Phone: 1-800-IPC-FICS Fax: (214) 404-9287

IPC's products are: ABACUS, provides billing and resource utilization management for data processing centers; FICS, a relationship banking solution for financial institutions; Visual Security System, a security product for developers.

**JMJ Technologies, Inc.**

Phone: (404) 509-5653/(800) 677-5653 Fax: (404) 973-8194

Quality client/server solutions using OO technology. Uls include PowerBuilder, VB, C++. DBMSs include SQL Server, Sybase, Ingres, Access. Solutions glued with OLE, ODBC, DDE, Wireless LANs, Remote Access.

**Micro-Frame Technologies, Inc.**

430 N. Vineyard, Suite 102

Dartario, California 91764

Phone: (909) 938-2711 Fax: (909) 984-5382

ProjectServer converts Microsoft Project into a client/server solution for managing multiple projects. Features multi-project task updating with automatic posting to Project; on-line status reports; action item tracking; automated file uploading; and timesheets.

**SQL Financials**

Two Ravinia Drive, Suite 1000

Atlanta, GA 30346

Phone: (404) 390-3900 Fax: (404) 390-3999

SQL Financials develops and support cross-industry client/server financial applications for a wide range of environments. These high performance applications are fully functional, intuitive, quick to implement and provide a rapid return on customer investment

### SYSTEMS INTEGRATION

**Corporate Software Inc.**

2 Edgewater Dr.,

Norwood, MA 02062

Phone: (617) 440-1170 Fax: (617) 440-7083

International provider of microcomputer software, support and systems integration services for businesses and institutions. Services include software support, technical training, pilot implementations, consulting, software integration and migration management.

**EDM Inc. 4075 Papazian Way, Ste 205, Fremont, CA**  
94538 (510) 438-9651 - VB, NT, SQL, PowerBldr.,  
Conversions, Imaging.

**G.A. Parks Consulting Group, Inc.**

342 Madison Avenue, Suite 1430

New York, NY 10173

Phone: (212) 286-0777

Improve your existing investment. WFW, NT, Access, hardware, sales, support, service, design, full help desk support.

**Indus Consultancy Services**

140 E Ridgewood Ave

Paramus, NJ 07652

Phone: (201) 261-3100 Fax: (201) 261-1399

Indus Consultancy Services (ICS), the systems integrator of choice, will help you implement Distributed Databases, Client/Server, GUI and OO Systems. ICS specializes in Microsoft Windows NT, SQL Server, SMS, Access and Visual C++.

**LANSystems Inc. - (800) ASK.4.LAN**

**Network Six, Inc.**

475 Kilvert Street

Warwick, RI 02886

Phone: (401) 732-9000 Fax: (401) 732-9009

Providing systems integration services to government human services agencies, using information technology - including project management, systems design, software development, hardware procurement/installation, training, and data conversion.

**Random Access, Inc.**

8000 East Illif Avenue

Denver, CO 80231

Phone: (303) 745-9600 Fax: (303) 745-0242

Random Access is a leading provider of information technology solutions. Headquartered in Denver, Random Access has branch offices in Colorado Springs and Boulder, Seattle, Portland, Phoenix, Salt Lake City, Boise, Houston, Omaha and Minneapolis.

**Systems Research and Applications Corporation**

2000 15th St.,

No Arlington, VA 22201

Phone: (703) 803-1500 Fax: (703) 803-1509

SRA provides solutions for industry and government. Specific markets include health, manufacturing, legal and retail, with expertise in integration, telecommunications, networks, imaging, multimedia, full text-document management, and business reengineering.

**Tech-Comm, Inc. LAN-MAN Network Experts**

Birmingham, AL (205) 250-8053

### SYSTEMS INTEGRATION/MESSAGING

**Wordlink**

2009 Fox Drive

Champaign, IL 61820

Phone: (217) 359-9378 Fax: (217) 373-6279

WORDLINK offers of complete set of networking, information integration and authorized education services designed for Microsoft solutions. WORDLINK has locations in Illinois, Indianapolis, Missouri and California.

### TRAINING

**Computer Savvy, Inc., 2382 W Oakland Park Blvd., Ft.**

Lauderdale, FL 33311 Phone: (305) 486-0644; Fax:

(305) 486-5659; PC Training Network Certification

MSU, Windows Training & Development Center,

Houston, TX (713) 650-0333 Fax: (713) 650-0060.

### TECHNICAL TRAINING

**Digital Equipment Corporation**

129 Parker Street

Maynard, MA 01754

Phone: (800) 332-5656 Fax: (603) 884-6655

Come to us for a complete turnkey solution that includes registration, scheduling, and accounting, as well as course development delivery and testing. It's training at its best-in your best interest.

**Meliora Systems, Inc.**

95 Allens Creek Road, Building 2, Suite 302

Rochester, NY 14618

Phone: (716) 461-1900 Fax: (716) 461-1989, E-Mail:

70742.3173@Compuserve.com

As one of the country's premier Microsoft Solution Provider Partners and Authorized Technical Education Centers, Meliora Systems is a leading provider of consulting and training on Microsoft Office and BackOffice.

### WORKGROUP AUTOMATION

**Kois & Associates, Inc**

(212) 255-1956.

Specialists in workgroup automation & customization with all flavors of Windows (Workgroups, NT), MS apps (Word, Excel, Access, Mail), & MS BASICs (VB, WordBasic, VBA).



# COMPUTERWORLD's Code of Ethics

1. Computerworld's first priority is the interest of its readers.
2. Editorial decisions are made free of advertisers' influence.
3. We insist on fair, unbiased presentation in all news and articles.
4. No advertising that simulates editorial content will be published.
5. Plagiarism is grounds for dismissal.
6. Computerworld makes prompt, complete corrections of errors.
7. Journalists do not own or trade in computer industry stocks.
8. No secondary employment in the IS industry is permitted.
9. Our commitment to fairness is our defense against slander.
10. All editorial opinions will be clearly labeled as such.

## WORDS WE LIVE BY.

When you pick up a copy of *Computerworld*, you know you're getting the most objective, unbiased news and information in IS. Our code of ethics guarantees it.

Why do we make such a big deal out of editorial integrity?

Because the words you read in *Computerworld* often have a dramatic impact on your business, your career, and your future.

You use this information to evaluate new products.

To get a candid view of emerging technologies. To find out the inside story on corporate strategies. To decide whether to jump ship or stay in your current job.

To get the edge on your competition.

In short, *Computerworld* is filled with the words IS professionals like you live by.

## WORDS YOU WORK BY.

Week in and week out, our editors and reporters call it the way they see it — on issues ranging from network management to reengineering. They dig deeply to bring you the most accurate, comprehensive news in IS.

It's no wonder over 140,000 IS professionals pay to subscribe to *Computerworld* every week. Shouldn't you? Order today and you'll receive 51 information-packed issues. Plus, you'll get our special bonus publication, *The Premier 100*, an annual profile of the leading companies using IS technology.

Call us toll-free at **1-800-343-6474**. Or use the postage-paid subscription card bound into this issue.

You'll get the kind of straightforward, impartial reporting you can work by. You have our word on it.

# COMPUTERWORLD

The Newspaper of Information Systems Management  
September 5, 1994, Vol. 28, No. 36, 146 Pages, \$6/Copy, \$48/Year

## COMPUTERWORLD

### Object standards accelerate

Microsoft blesses emerging standard IBM pulls mainframe into new development role

**By Melinda Carol Hille**  
The Irish Republican Army was not the only group offering an olive branch in Europe last week. To the relief of many corporate developers, Microsoft Corp. officially ended the war of words with the industry's major object standards group. The desktop behemoth is now taking part in the standards process. At an Object Management Group meeting in Dublin, Microsoft threw its weight behind an emerging specification that would allow its Common Object Model to interoperate with the OMG's Common Object Request Broker Architecture (CORBA). The move offers hope to beleaguered programmers who have been facing the unpleasant task of implementing different object models on different platforms. Until last week, Microsoft said it would rely on other vendors' implementations of CORBA. *Microsoft, page 14*

**By Ed Russell**  
In early October, IBM will roll out several object-based tools designed to finally and fully involve the mainframe in corporate client/server development. The computer giant will announce versions of C++ and Smalltalk, an object-oriented version of Cobol for its MVS mainframe operating system, according to sources briefed by IBM. The company will also announce its own class libraries, called the Application Class Library Services. The announcement is tentatively scheduled for Oct. 4. Final versions of these tools are expected to be available at varying dates from mid- to late 1995. Among the select few corporate information systems shops that have examined early versions of the products, most believe they give IBM the best chance yet of realizing its deferred dream of cross-platform application development. *IBM, page 14*

### Success strains SAP Support

**By Rosemary Caffaro**  
ORLANDO, Fla. After 20 years of chugging alongside other conservative mainframe software vendors, SAP AG is suddenly facing the fast-paced market of success in the client/server market. Its most jarring note so far is dealing with a shortage of consulting expertise. The German company is emerging as a dominant force against competitors such as Oracle Corp. SAP has built a worldwide customer base of 1,500 for its 2-covered R/3 client/server suite of integrated applications. Its Sapphire International '91 user conference here last week drew 4,000 attendees. Also last week, SAP announced that Pacific Gas & Electric Co. in San Francisco had signed an \$8 million contract for R/3. "Partly what we were looking for was a client/server business system as opposed to just an accounting system," said Tom King, controller at PG&E. "We were looking for that integration, and we wanted it all tied together. SAP met that criteria." At Foxmeyer Corp., a pharmaceutical company in Carrollton, Texas, CIO Robert Brown said, "We are betting our company on this." Foxmeyer plans to replace a mix of legacy systems, including IBM DB2 mainframe applications and System/360, with SAP software by the end of next year. R/3 was part of an extensive evaluation of other client/server application offerings, but it beat the competition in volume processing, Brown said.

**Service stretch**  
The downside is that the R/3 market has exploded so quickly that SAP and its consulting partners are stretching to provide adequate implementation services. This is no small problem because SAP, page 120

### All clears for telecommuting

**By Mark Bets**  
Time to hit the accelerator on those fledgling plans for a telecommuting program. By Nov. 15, large companies in the nation's smoggiest cities must have a plan for cutting employee commuting by 25% to comply with the latest federal clean air law. The requirement will have an impact on an estimated 13 million employees in such metropolitan areas as Los Angeles, San Diego, Milwaukee, Chicago, Houston, Philadelphia, Baltimore and the New York/New Jersey region.

**Some pioneering firms, such as Newark, N.J.-based Prudential Insurance Co. and Palo Alto, Calif.-based Hewlett-Packard Co., are gearing up to include telecommuting as part of their compliance plans.** Prudential has several business units where computer programmers and customer service agents now work from home at least one day a week, said Rita Russomano, associate manager in the insurer's clean air compliance office. Part of the reason is clearly the Clean Air Act, she said. Environmental regulations are getting [business units] to start tele programs, but then they are reaping other benefits such as reduced office space and more productive employees," Russomano added. *Telecommuting, page 129*

### COMPUTERWORLD'S EIGHTH ANNUAL SALARY SURVEY

**CASH ON DELIVERY**  
Computerworld's Eighth Annual Salary Survey finds that IS professionals' pay is increasingly linked to their performance, and many more seek it was. Also, our readers reveal which jobs are hot, and where to find the biggest paychecks and benefits packages. *Salary survey, page 30*

### TELEWORK SUPPORT

**What technology does your company use for telecommuting?**

85%	63%	44%
Local Area Network (LAN)	Modem	Wide Area Network (WAN)
Other	Other	Other

*Source: Business Research Group, Newton, Mass.*



## Computerworld, Inc.

**CEO/President**  
Gary J. Beach

**Executive Vice President:**  
Steven F. Voit

**Senior Vice President/Finance:**  
Matthew C. Smith

**Vice President/Human Resources:**  
Susan C. Perry

**Executive Assistant to the CEO/President**  
Karen E. Elliott

## Computerworld

An IDG Company: The World's Leader in Information Services on Information Technology

**Publisher**  
Kevin McPherson

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171 Phone: 508-879-0700, FAX: 508-875-4394

**Vice-President Editorial**  
Bill Laberis

**Vice-President Sales/Associate Publisher**  
David Peterson

**Vice-President Consumer Marketing**  
Gail Odeneal

**PUBLISHER'S OFFICE:** Assistant to the Publisher, Lois Beninati **SALES CLASSIFIED:** Classified Operations Director, Cynthia Delany **MARKETING:** Director, Marketing Communications, Mary Doyle, Senior Manager, Marketing Communications, Elizabeth Phillips, Manager, Trade Show & Conventions, Audrey Shohan, Marketing Communications Account Manager, Susan Thaxter, Administrative Assistant, Patty White **CIRCULATION:** Director of Circulation Management, Maureen Burke **PRODUCTION:** Production Director, Christopher P. Cuoco, Production Manager, Beverly Wolff **DISTRIBUTION:** Distribution Manager, Bob Wescott, Traffic Manager, Pat Walker

## Sales Offices

**Associate Publisher/Vice-President/Sales**  
David Peterson

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171 Framingham, MA 01701-9171 Phone: 508-879-0700, FAX: 508-879-0446

### Northeast

Regional Vice President: Sherry Driscoll, Senior District Managers: Bill Cadigan, John Watts, Sales Office Coordinator: Tammy Grymiewicz, Sales Assistants: Laura Holliday, Barbara Shuman, 470 Totten Pond Rd., 5th Floor, Waltham, MA 02154 (508) 879-0700 FAX: (617) 890-2669 TDD: (800) 428-8244

### Mid-Atlantic

Senior District Managers: Fred LoSapio, Vicki Gonin, Rich Molden, Sales Assistants: Susan Kusnie, Jean Dellarobba, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090 FAX: (201) 712-9786 TDD: (800) 208-0288

### South-Atlantic

Regional Vice President: Bernie Hockswender, Sales Assistant: Jennifer Pattenaude, 3675 Crestwood Parkway, Suite 400, Duluth, GA 30136 (404) 931-8104 FAX: (404) 931-8106 TDD: (800) 449-4974

### Midwest

Senior District Manager: Sharon R. O'Brien, Sales Assistant: Denice Richards, 980 N. Michigan Avenue, Suite 1400, Chicago, IL 60611 (312) 214-3606 FAX: (312) 214-4962

### Southwest

Senior District Manager: Darren Ford, Sales Assistant: Brenda Shipman, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0832 FAX: (214) 385-1603 TDD: (800) 822-4918

### Northern California

Vice-President Western Advertising Sales: Richard Espinoza, Senior District Managers: Ernie Chamberlain, Kaye Sharbrough, Linda Holbrook, District Managers: Christine Curry, Elizabeth Cooper, Lisa Kowalski, West Coast Operations Manager: Leticia Lehane, Sales Associates: Denise Hui, Emily Gaytan, Shannon Dempsey, Denise Garcia, Andrea Zurek, Jim Schott, Colleen Molnar 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312 TDD: (800) 900-3179

### Southern California

District Manager: Nancy Coy, Sales Associate: Rachel Gillis-Swartz, 2171 Campus Drive, Suite 300, Irvine, CA 92715 (714) 250-3942 FAX: (714) 476-8724

### Advertising Operations

Display Advertising Production Manager: Paula Wright, Display Advertising Coordinators: Lisa Tanner, Peggy Hennessy, Gregg Pinsky, (508)-879-0700 FAX: (508) 879-0446

### Custom Publications

**Boston:** Vice President/Larry Craven, Director of Publishing Services/Carolyn Novack, Sales Assistant/Heldi Broadley, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 879-0446

**San Francisco:** West Coast Director/Elaine R. Offenbach, Sales Associate/Nikki Wilson, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

### Client/Server Journal

Associate Publisher: James Hussey, 375 Cochituate Rd., Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 872-2364

**East:** John Watts, 470 Totten Pond Rd., 5th Floor, Waltham, MA 02154, (508) 879-0700 FAX (617) 890-2669

**West:** Kaye Sharbrough, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

### Marketplace Advertising

Sales Manager/Michelle Reeves, **Northeast** Account Executive/Susan Cardoza, **Central/Southeast** Account Executive/Kevin Gasper, **Western** Account Executive/Claude Garbarino, Marketing Communications Manager/Karen Lesko, Classified Solutions/Nancy Whittaker, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474 FAX: (508) 820-0941

### Recruitment Advertising Sales Offices

Vice President/Recruitment Advertising/John Corrigan, Marketing Director/Derek E. Hulitzky, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474

**New England:** Regional Manager/Nancy Percival, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, Account Executive/Nancy Mack, (800) 343-6474

**Mid-Atlantic:** Regional Manager/Marty Finn, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090, Account Executive/Caryn Dlott, (800) 343-6474 TDD: (800) 208-0288

**South-Atlantic:** Regional Manager/Katie Kress, 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sr. Account Executive/Pauline Smith (800) 343-6474

**Midwest:** Regional Manager/Pat Powers, 1011 East Touhy Avenue, Suite 550, Des Plaines, IL 60018 (708) 827-4433, Sr. Account Executive/Ellen Cross (800) 343-6474 TDD: (800) 227-9437

**West:** Regional Manager/Barbara Murphy, 2171 Campus Drive, Ste. 100, Irvine, CA 92715 (714) 250-0164, Sr. Account Executive/Christopher Glenn (800) 343-6474 TDD: (800) 208-5867

**Computer Careers Online:** Jay Savell, Account Executive, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474

### Direct Response Cards

375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474

Account Manager/Norma Tamburrino, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

### Computerworld Database Division

Vice President/General Manager, Customer Information Division: Richard Mikita, Vice President Sales: John Carpenter, Sales Assistant: Jennifer Claus.

**East:** Account Executive VAR Database, Carol Mullen, Database Representative, Buyers Database, Linda Clinton, (508) 879-0700 FAX: (508) 879-0184

**West:** Account Executive VAR Database, Chris Jones, Database Representative, Buyers Database, Gena Haas, (415) 347-0555 FAX: (415) 347-8312

### Response Technologies

President: Charles Coleman, Chief Operating Officer: Jaye Tyler, (508) 626-1700 FAX: (508) 626-0027, Internet: rti @ delphi.com, CompuServe: 74403,2745

### International Data Group

**Chairman of the Board,** Patrick J. McGovern; **President,** Kelly Conlin; **Chief Operating Officer,** Jim Casella; **Vice President Finance,** William P. Murphy

Computerworld is a publication of International Data Group, the world's largest publisher of computer related information and the leading global provider of information services on information technology. International Data Group publishes over 200 computer publications in 63 countries. Forty million people read one or more International Data Group publications each month. International Data Group's publications include: ARGENTINA'S Computerworld Argentina, Infoworld Argentina; AUSTRALIA'S Computerworld Australia, Australian PC World, Australian Macworld, Network World, Mobile Business Australia, Publish, Reseller, IDG Sources; AUSTRIA'S Computerwelt Osterreich, PC Test; BELGIUM'S Data News (CW); BOLIVIA'S Computerworld; BRAZIL'S Computerworld, Gamepro, Game Power, Mundo Unix, PC World, Publish, Super Game; BULGARIA'S Computerworld Bulgaria, Edworld, PC & Mac World Bulgaria, Network World Bulgaria; CANADA'S CIO Canada, Computerworld Canada, Graduate Computerworld, InfoCanada, Network World Canada, Reseller, CHILE'S Computerworld Chile, Informatica; COLOMBIA'S Computerworld Columbia PC World; COSTA RICA'S PC World; CZECH REPUBLIC'S Computerworld, Elektronika, Macworld, PC World; DENMARK'S Communications World, Computerworld Danmark, LOTUS World, Macintosh Produktkatalog, Macworld Danmark, PC World Danmark, PC World Produktguide, Tech World, Windows World, ECUADOR'S PC World, EGYPT'S Computerworld(CW) Middle East, PC World Middle East; FINLAND'S Mikro PC, Tietovilkko, Tietovarkko; FRANCE'S Distributique, GOLDEN MAC, InfoPC, Languages & Systems, Le Guide du Monde Informatique, Le Monde Informatique, Telecons & Reseaux, GERMANY'S Computerwoche, Computerwoche Focus, Computerwoche Extra, Computerwoche Karriere, Electronic Entertainment, Gamepro, Information Management, Macwelt, Netzwelt, PC Welt, PC Woche, Publish, Unit; GREECE'S Infoworld, PC Games; HONG KONG'S Computerworld Hong Kong, PC World Hong Kong, HUNGARY'S Computerworld SZT, PC World, INDIA'S Computers & Communications; INDONESIA'S Info Komputer, IRELAND'S ComputerScope; ISRAEL'S Computerworld Israel, PC World Israel; ITALY'S Computerworld Italia, Lotus Magazine, Macworld Italia, Networking Italia, PC Shopping Italy, PC World Italia, JAPAN'S Computerworld Today, Information Systems World, Macworld Japan, Nikkei Personal Computing, SunWorld Japan, Windows World; KENYA'S East African Computer News; KOREA'S Computerworld Korea, Macworld Korea, PC World Korea; LATIN AMERICA'S GameProp; MALAYSIA'S Computerworld Malaysia, PC World Malaysia, MEXICO'S Compu Edicion, Compu Manufactura, Computacion/Punto de Venta, Computerworld Mexico, MacWorld, Mundo Unix, PC World, Windows; THE NETHERLANDS' Computer Totaal, Computable (CW), LAN Magazine, MacWorld, Totaal "Windows"; NEW ZEALAND'S Computer Listings, Computerworld New Zealand, Network World, New Zealand PC World, NIGERIA'S PC World Africa, NORWAY'S Computerworld Norge, C'World, Lotusworld Norge, Macworld Norge, Network, PC World Ekspres, PC World Norge, PC World's Produkt Guide, Publish & Multimedia World, Student Oaza, Unix World, Windowsworld; IOG Direct Response; PAKISTAN'S PCWorld Pakistan; PANAMA'S PC World Panama; PERU'S Computerworld Peru, PC World, PEOPLE'S REPUBLIC OF CHINA'S China Computerworld, China Infoworld, China PC & Communications Magazine, Computer Fan, PC World China, Electronics International, Electronics Today/Multimedia World, Electronic Product World, China Network World, Software World Magazine, Telecom Product World; PHILIPPINES' Computerworld Philippines, PC Oigest (PCW); POLAND'S Computerworld Poland, PC World Komputer; PORTUGAL'S Cerebro PC World, Correo Informatico/Computerworld, MacIn; ROMANIA'S Computerworld, PC World, Telecom Romania, RUSSIA'S Computerworld Moscow, Mir PK (PCW), Sety (Networks); SINGAPORE'S Computerworld Southeast Asia, PC World Singapore; SLOVENIA'S Monitor Magazine; SOUTH AFRICA'S Computer Mail (CIO), Computing S.A., Network World S.A., Software World, SPAIN'S Advanced Systems, Amiga World, Computerworld Espana, Comunicaciones World, Macworld Espana, NeXTWORLD, Super Juegos Magazine (GamePro), PC World Espana, Publish: SWEDEN'S Attack, ComputerSweden, Corporate Computing, Macworld, Mikrodatorn, Närke & Kommunikation, PC World, Publishing & Design (CAP), Datalingenjoren, Maxi Oaza, Windows World, SWITZERLAND'S Computerworld Schweiz, Macworld Schweiz, PC Tip; TAIWAN'S Computerworld Taiwan, PC World Taiwan; THAILAND'S Thai Computerworld, TURKEY'S Computerworld Monitor, Macworld Turkey, PC World Turkey; UKRAINE'S Computerworld, UNITED KINGDOM'S Computing/Computerworld, Connexion/Network World, Lotus Magazine, Macworld, Open Computing/Sunworld, UNITED STATES' Advanced Systems, AmigaWorld, Cable in the Classroom, CD Review, CIO, Computerworld, Digital Video, DOS Resource Guide, Electronic Entertainment Magazine (E2), Federal Computer Week, GamePro, IOG Books, Infoworld, Laser Event, Macworld, Multimedia World, Network World, PC Letter, PCWorld, Playfight, Power PC World, Publish, SWATPro, Video Event, VENEZUELA'S Computerworld Venezuela, PC World Venezuela; VIETNAM'S PC World Vietnam

## Have a Problem With Your Computerworld Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

**COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.**

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

### Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line.

### Your New Address Goes Here

Address shown: ☐ Home ☐ Business

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Name			
Title	Company		
Address			
City	State	Zip	

### Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available: **1-800-669-1002** Outside U.S. call (614) 382-3322

CompuServe members can reach us at account number 73973, 1230.

## Advertisers' Index

Anderson Consulting	67
Apple	41
Apple Enterprise Awards	84
AST Research	52
AT&T Paradyne	57
Borland	29
Chipcom	76
Cleo Communications	53
Command Technology	15
Compaq Computer Corp.	9
Computer Associates	26-27
Computer Museum	68
Computron	33
CW Circulation	24, 108
CW Client/Server Journal Top	25/54
Dell	112, C4
Digital Equipment Corp.	22-23
EMC	60
Hewlett Packard	38
IBM	44, 115
IMRS	71-73
Information Builders	17
Informix Software	25
Interface Group	82
Legent Software	36-37
Lotus Development Corp.	47, 80
Micom	49
Micro Focus	7
Microsoft	58-59, 64-65
Minolta	10
NEC Electronics	30-31
Novell	50-51
Object World	62
Oracle	5
Powersoft	74-75
Proteon	18-19
Rolm	11
SAS Institute	21, 86
Sequoia	48
Sun World	20
SunSoft	88
Sun Microsystems	43
Sybase	13
Symantec	70, 83
Syncsort	3
Toshiba	79

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

## Marketplace Advertisers' Index Pages 101-107

Alicomp, Inc.	(800) 274-5556
Allen Systems Group	(800) 932-5536
American Software	(800) 264-5770
B.L. Associates	(617) 982-9664
Boxlight	(800) 762-5757
Bruns-Pak	(908) 756-1222
Computer Marketplace	(800) 858-1144
Consultec	(800) 563-2881 X337
Cybex	(214) 430-4040
Cylink Corp.	(800) 523-3958
Dempsey Business Systems	(800) 888-2000
Electronic Resource Recovery	(914) 427-2100
Fanemil Systems	(703) 374-3636
Knozan	(800) 327-8698
NetManage, Inc.	(415) 974-7154
Panelight	(800) 724-0599
Spectra Equipment	(800) 745-1175



# Companies in this issue

Page number refers to page on which story begins

3Com Corp. .... 53,56

## A

Aberdeen Group ..... 6,12,14  
Adaptive Solutions, Inc. .... 73  
Advanced Logic Research, Inc. .... 32  
Advanced Manufacturing Research, Inc. .... 24,63  
Advanced Software Technologies, Inc. .... 73  
Advanced Systems Group ..... 46  
Aha Software, Inc. .... 28  
Allied Signal, Inc. .... 24  
Allied Signal Aerospace Co. .... 8  
Amdahl Corp. .... 1,61  
American Express Co. .... 81  
American Express Financial Corp. .... 77  
American Management Systems, Inc. .... 81  
Andersen Consulting ..... 53,63  
Ansell Corp. .... 63  
Ansell International ..... 63  
Apple Computer Europe ..... 32  
Apple Computer, Inc. .... 4,10,12,16,32,53  
Ardis Co. .... 6  
AST Research, Inc. .... 4  
Astea International, Inc. .... 66  
AT&T Corp. .... 91  
AT&T Network Systems ..... 53  
AutoPacific, Inc. .... 91  
Avail Systems Corp. .... 20

## B

Baan Co. .... 24  
Bank of Montreal ..... 14  
Bankers Trust Co. .... 14  
Banyan Systems, Inc. .... 39  
Baxter International ..... 1  
Bay Networks, Inc. .... 8  
Bell Atlantic Corp. .... 8  
Bell Canada ..... 1  
Belleore ..... 12  
Blackbaud, Inc. .... 69  
BMC Software Inc. .... 8  
BMG Entertainment ..... 81  
BMW of North America, Inc. .... 91  
Boeing Co. .... 24  
Borland International, Inc. .... 14  
Brainstorm Technologies, Inc. .... 14  
British Airways ..... 66

## C

Caere Corp. .... 49  
California Compensation Insurance Co. .... 12,16  
Camp Dresser & McKee, Inc. .... 4  
Candle Corp. .... 66  
Cedars-Sinai Medical Center ..... 81  
CenterView Software, Inc. .... 69  
Central Point Software ..... 8  
Chevron Information Technology Co. .... 1  
Cheyenne Software, Inc. .... 20  
Chicago & NorthWestern Railroad, Inc. .... 39  
Chrysler Corp. .... 91  
CIMI Corp. .... 53,56  
Cisco Systems, Inc. .... 8,10,53,56  
CMstat Corp. .... 66  
Community Mutual Insurance Co. .... 8  
Compaq Computer Corp. .... 1,4,32  
Complex Architectures, Inc. .... 6  
CompuAdd Corp. .... 4  
Computer Associates International, Inc. .... 8,24,63,66  
Computer Security Institute ..... 90  
Computer Systems Advisors, Inc. .... 49  
Concurrent Computer Corp. .... 8  
CoroNet Systems, Inc. .... 1  
Covia Corp. .... 6  
Cray Research, Inc. .... 61  
Currid & Co. .... 45

## D

D. H. Brown Associates, Inc. .... 61  
Dartmouth Hitchcock Medical Center ..... 1  
Data General Corp. .... 12,28,63  
Dataquest, Inc. .... 16,45,46  
Dell Computer Corp. .... 4  
Deloitte & Touche ..... 1,81

Delphi Consulting Group ..... 28  
Delrina Corp. .... 28,49  
Digi International, Inc. .... 40  
Digital Equipment Corp. .... 8,12,14,16  
..... 28,45,53  
Digitalk, Inc. .... 69,73  
Duke Power Co. .... 55,81  
Dun & Bradstreet Software ..... 24

## E

Eastman Kodak Co. .... 1  
Electronic Data Systems Corp. .... 91,101  
Enterprise Systems Management Corp. .... 56  
Ernst & Young ..... 90,131  
Europcar International SA ..... 63  
Eventus Software, Inc. .... 66  
Extension Technology Corp. .... 32

## F

FileNet Corp. .... 28  
Firestone Textiles Co. .... 45  
First Virtual Holdings, Inc. .... 101  
Frye Computer Systems, Inc. .... 39,46  
Fujitsu Personal Systems Ltd. .... 28

## G

Galacticomm, Inc. .... 49  
Galileo International ..... 6  
Gannett Co. .... 81  
Gartner Group, Inc. .... 1,10,14,20  
..... 39,55,61,101  
General Cinema Corp. .... 81  
General Motors Corp. .... 91  
Genicom Corp. .... 32  
Germantown Hospital and Medical Center ..... 81  
Group 1 Software, Inc. .... 61

## H

Harris Anacom Network Services, Inc. .... 32  
Harris Computer System ..... 8  
Hartford Hospital ..... 81  
Hatfield Quality Meats, Inc. .... 45  
Healthcare Data Exchange ..... 6  
HealthOne ..... 81  
Hewitt Associates LLC ..... 1  
Hewlett-Packard Co. .... 1,4,8,12,16,28  
..... 32,42,45,49,55,63,66  
Hoechst Celanese Corp. .... 77  
Hoffman-Laroche Ltd. .... 81  
Holosoft, Inc. .... 14  
HyperDesk Corp. .... 14

## I

IBM ..... 1,8,12,14,16,28  
..... 32,39,49,55,61,63,66,69,73  
IBM PC Co. .... 4,42  
Illuminata ..... 45  
ImageFast Software Systems, Inc. .... 49  
Informix Software, Inc. .... 28  
Intel Corp. .... 4,16,45  
International Data Corp. .... 1,4,20,32,39  
..... 45,46,55,61  
Interphase Corp. .... 56  
Intersolv, Inc. .... 14,73  
Intuit, Inc. .... 16,131  
Inventec Group ..... 4  
Invincible Technologies Corp. .... 66  
IR Consulting ..... 81  
ITT Hartford Insurance Group ..... 28  
ITT Hartford Life & Annuity Insurance Co. .... 61

## J

J. D. Edwards & Co. .... 24  
John Deere & Co. .... 53  
John Hancock Financial Services ..... 81  
Johnson Controls, Inc. .... 1

## K

Kaleida Labs, Inc. .... 32  
Konica Business Machines, U.S.A., Inc. .... 81  
KPMG Peat Marwick ..... 1

## L

Legent Corp. .... 55

Liberty Mutual Insurance Group ..... 77  
Lincoln National Life Insurance Co. .... 81  
Logiccode Technology, Inc. .... 42  
Los Alamos National Laboratory ..... 12  
Lotus Development Corp. .... 1,4,14,28  
..... 46,91,101

## M

Make Systems, Inc. .... 1  
Malaysia Airlines ..... 66  
Management Consulting and Research, Inc. .... 45  
Management Robotics, Inc. .... 66  
Marcam Corp. .... 24  
Martin Marietta Corp. .... 55  
Matra Datavision, Inc. .... 45  
Maxxus, Inc. .... 8  
McCaw Cellular Communications, Inc. .... 55  
McConnell Consulting Co. .... 45  
MCI Communications Corp. .... 55  
Meta Group, Inc. .... 28  
Metropolitan Life Investment Management Corp. .... 14  
Mexicana Airlines ..... 66  
Microcom, Inc. .... 32  
Micronics Computers, Inc. .... 4  
Microsoft Corp. .... 1,8,12,14,16,20,28  
..... 39,40,45,46,53,56,66,69,71,101,113  
Militope Group, Inc. .... 81  
Modatech Systems, Inc. .... 42  
Monsanto Co. .... 1  
Multi-Tech Systems, Inc. .... 42

## N

NASA ..... 40  
National Semiconductor Corp. .... 101  
Natural Microsystems, Inc. .... 55  
NEC Corp. .... 66  
Net Market Co. .... 101  
NetPro Computing, Inc. .... 56  
Netscape Communications Corp. .... 32  
Noranda, Inc. .... 81  
Norfolk Southern Corp. .... 46  
Northern Telecom, Inc. .... 1,24,101  
Novell, Inc. .... 1,8,10,12,20,32  
..... 39,45,46,53,55,56,66

## O

Omega Research, Inc. .... 131  
Omron Health Care, Inc. .... 45  
Open Networks, Inc. .... 46  
Open Systems Advisors ..... 14  
OpenVision Technologies, Inc. .... 66  
Oracle Corp. .... 1,4,6,24,28,45,63,66  
Orchid Technology ..... 42

## P

Pacific Bell ..... 81  
Palindrome Corp. .... 20  
ParePlace Systems, Inc. .... 69  
PeopleSoft, Inc. .... 66  
Pepsico, Inc. .... 81  
Performix ..... 69  
Poet Software Corp. .... 73  
Postalsoft, Inc. .... 61  
Powersoft Corp. .... 73  
Progress Software Corp. .... 69  
Proton, Inc. .... 8  
Protoview Development Corp. .... 14  
Prudential Securities, Inc. .... 66

## R

Racotek, Inc. .... 6  
RAM Mobile Data USA LP. .... 6  
RCI Ltd. .... 61  
Retex ..... 55  
Reveo D. S., Inc. .... 66  
Rockford Health System ..... 81  
Ross Systems, Inc. .... 24  
RSA Data Security, Inc. .... 90,101  
RWJ Health Care Corp. .... 81

## S

Samsonite Corp. .... 46  
Samsung Electronics Ltd. .... 4  
SAP AG ..... 24

SBM Computers and Communications Corp. .... 69  
Scientific-Atlanta, Inc. .... 53  
Scotiabank ..... 69  
Sequent Computer Systems, Inc. .... 63  
Share, Inc. .... 1  
Shared Medical Systems Corp. .... 6  
Shell Group ..... 8  
Shell Oil Corp. .... 8  
Sheridan Software Systems, Inc. .... 69  
Shiva Corp. .... 28  
Silicon Graphics, Inc. .... 12,32,49,53,61  
Simware, Inc. .... 55  
Snap-on, Inc. .... 24  
Southern Company Service ..... 39  
Spiegel, Inc. .... 53  
SRI International ..... 12  
St. Francis Medical Center ..... 81  
Stac Electronics ..... 8  
Staffware Corp. .... 28  
Standish Group International, Inc. .... 6  
Stanford Health Services ..... 56  
Stone Container Corp. .... 39  
Sun Microsystems, Inc. .... 12,16,28,45,49,56  
SunSoft, Inc. .... 8  
Swiss Bank Corp. .... 55  
Sybase, Inc. .... 6,28,63  
Symantec Corp. .... 42  
Synchronx ..... 63

## T

Tandem Computers, Inc. .... 66  
TechBridge Technology Corp. .... 73  
TechServe, Inc. .... 131  
Temps & Co. .... 55  
Tenon Intersystems ..... 49  
Texas Instruments Europe ..... 32  
Texas Instruments, Inc. .... 42  
TGV Software, Inc. .... 32  
The Chase Manhattan Bank NA ..... 1,61  
The Toledo Hospital ..... 81  
The Tolly Group ..... 8  
The Travelers Insurance Co. .... 6  
The Well ..... 8  
Thompson Software Products ..... 73  
Time Warner Cable ..... 53  
Toshiba America Information Systems, Inc. .... 28  
Total Tec Systems, Inc. .... 45  
Trax Softworks, Inc. .... 14  
Trimco ..... 28  
TriTeal Corp. .... 12

## U

U.S. Bancorp. .... 66  
U.S. Postal Service ..... 61  
UES, Inc. .... 49  
Union Pacific Technologies ..... 6  
Unisys Corp. .... 66  
University of Michigan Medical Center ..... 81

## V

Verimatrix, Inc. .... 46  
Versant Object Technology Corp. .... 69  
Visible Systems Corp. .... 73  
Visigenic Software, Inc. .... 32

## W

W.B. Saunders Co. .... 1  
W.R. Grace & Co. .... 81  
Wachovia Operational Services Corp. .... 81  
Washington Federal Bank ..... 1  
Watcom International ..... 49  
Wells Fargo Bank ..... 81  
Wildfire Communications, Inc. .... 55  
Wilson Sporting Goods ..... 6

## X

X/Open Co. .... 12  
Xcelsius, Inc. .... 6

## Z

Zenith Data Systems ..... 4  
Zcos International, Inc. .... 4  
Zoom Telephonics, Inc. .... 42



# March 3 Stock Ticker

## Gainers

## Losers

### Percent

AMERICAN SOFTWARE INC.	31.9	STANDARD MICROSYSTEMS CORP.	-31.0
RACOTEK INC.	27.5	PARALLAN COMPUTER	-20.0
STATE OF THE ART	20.9	MERISEL (L)	-17.3
WEITEK	20.0	PENRIL DATA COMM NETWORKS	-17.2
WALL DATA INC.	17.8	BORLAND INT'L INC.	-14.3
IOMEGA CORP. (H)	17.5	XYLOGICS INC.	-14.0
MICRON TECHNOLOGY (H)	15.3	RASTEROPS	-12.2
LATTICE SEMICONDUCTOR (H)	13.5	MICROPOLIS CORP.	-11.8

### Dollar

MICRON TECHNOLOGY (H)	8.88	STANDARD MICROSYSTEMS CORP.	-8.88
TEXAS INSTRUMENTS	8.50	ITT CORP.	-3.88
WALL DATA INC.	7.88	XYLOGICS INC.	-3.25
KILINX (H)	7.00	BELLSOUTH CORP.	-2.50
US ROBOTICS	6.38	NETMANAGE INC.	-2.50
XEROX CORP.	5.13	COMPUWARE CORP.	-2.38
3 COM CORP. (H)	3.63	GENERAL DATACOMM INDS.	-2.38
IBM	3.25	BELL ATLANTIC CORP.	-2.13

## PCs aid stock picking

With Wall Street topping the 4,000 mark recently, people might consider putting the money hidden away in their mattress to good use. Though not a replacement for a broker, the bounty of affordable PCs and investment software on the market can help users get a start right at home.

According to Paul Garverick, a financial analyst at the American Association of Individual Investors (AAII) in Chicago, 80% of the group's 180,000 members use PCs, and 57% of those with PCs use them for investment analysis.

Intuit, Inc.'s popular and pervasive Quicken is a good starting point for many users. While it provides only basic features, Quicken can be enhanced with packages such as Ernst & Young's Prosper, which lets users develop a personal investment strategy and integrate it with Quicken's portfolio management system.

Wall Street Analyst from Omega Research, Inc. in Miami provides users with classic market studies and detailed explanations in addition to portfolio management features.

"It's like having an expert sitting there telling you what he thinks about the chart," said Bruce Babcock, a commodities trader in Sacramento, Calif. Roger Fredrickson, an investor in Pell City, Ala., downloads about 7,800 stocks and reviews charts produced by Wall Street Analyst to make investment decisions.

Garverick said a popular offering among AAIL members is CapTool, a DOS-based package from TechServe, Inc. in Issaquah, Wash. For those who do not want to invest in investment software, shareware titles such as Capital Gainz are widely available at file transfer protocol sites on the Internet. — *Tim Ouellette (timo@cw.com)*



EXCH 52-WEEK RANGE

MAR. 3 WK NET WK PCT  
3PM CHANGE CHANGE

Communications and Network Services				OFF 0.78%			
OTC	53.88	20.13	3 COM CORP. (H)	53.88	3.63	7.2	
NYS	44.38	36.25	AMERITECH CORP.	42.13	-0.50	-1.2	
NYS	57.13	47.25	AT&T	50.88	-0.38	-0.7	
OTC	19.75	12.75	BANYAN SYSTEMS INC.	17.00	0.00	0.0	
OTC	43.88	18.63	BAY NETWORKS INC.	32.50	0.38	1.2	
NYS	58.38	48.38	BELL ATLANTIC CORP.	51.88	-2.13	-3.9	
NYS	63.50	50.50	BELLSOUTH CORP.	57.00	-2.50	-4.2	
NYS	21.50	10.00	BOLT, BERANEK & NEWMAN	17.75	1.63	10.1	
OTC	16.50	9.00	BROOKTROUT TECHNOLOGY (H)	15.50	1.00	6.9	
NYS	52.88	33.06	CABLETRON SYSTEMS	41.63	2.75	7.1	
OTC	42.75	10.00	CENTIGRAM COMMUNICATIONS	15.00	0.00	0.0	
OTC	50.50	21.00	CHIPCOM CORP.	44.00	-0.50	-1.1	
OTC	40.75	18.75	CISCO SYSTEMS INC.	34.38	1.00	3.0	
OTC	13.75	6.13	COMPRESSION LABS INC.	8.38	0.63	8.1	
OTC	11.25	5.13	COMPUTER NETWORK TECH.	7.81	-0.06	-0.8	
OTC	21.75	7.50	CROSSCOMM	12.50	-0.88	-6.5	
OTC	4.13	2.00	DATA SWITCH CORP.	3.56	-0.19	-5.0	
OTC	39.00	17.88	DSC COMMUNICATIONS	36.19	0.94	2.7	
OTC	39.25	10.00	FORE SYSTEMS INC.	36.75	-0.25	-0.7	
NYS	35.88	10.00	GENERAL DATACOMM INDS.	20.75	-2.38	-10.3	
NYS	34.38	29.50	GTE CORP.	32.88	-0.75	-2.2	
NYS	99.75	77.00	ITT CORP.	95.25	-3.88	-3.9	
OTC	26.00	17.25	MCI COMMUNICATIONS CORP.	19.69	-0.06	-0.3	
OTC	15.75	7.00	MICOM COMMUNICATIONS CORP. (L)	7.38	-0.63	-7.8	
OTC	12.63	4.50	MICROCOM INC.	10.75	-0.38	-3.4	
OTC	10.50	4.00	NETRIX CORP.	8.25	-0.38	-4.3	
OTC	7.50	3.25	NETWORK COMPUTING DEVICES	5.25	-0.38	-6.7	
NYS	27.75	7.38	NETWORK EQUIPMENT TECH.	25.88	-0.63	-2.4	
OTC	28.50	13.88	NETWORK GENERAL	27.13	-0.13	-0.5	
OTC	9.38	5.06	NETWORK SYSTEMS CORP.	5.44	-0.06	-1.1	
NYS	63.38	26.50	NEWBRIDGE NETWORKS CORP.	33.75	0.00	0.0	
NYS	37.75	26.00	NORTHERN TELECOM LTD.	34.13	-0.25	-0.7	
OTC	25.38	13.38	NOVELL INC.	19.88	-0.25	-1.2	
NYS	40.25	33.25	NYNEX CORP.	38.88	-0.38	-1.1	
OTC	28.50	15.50	OCTEL COMMUNICATIONS CORP.	22.75	0.25	1.0	
OTC	37.50	12.00	OPTICAL DATA SYSTEMS INC.	27.13	-0.88	-3.1	
OTC	7.50	2.13	PENRIL DATA COMM NETWORKS	3.00	-0.63	-17.2	
OTC	28.25	10.00	PICTURETEL CORP. (H)	28.25	1.50	5.6	
OTC	8.13	2.13	PROTEON INC.	6.38	-0.25	-3.8	
OTC	12.38	2.75	RACOTEK INC.	6.38	1.38	27.5	
OTC	10.50	3.50	RETIX	4.88	0.38	8.3	
NYS	23.75	12.44	SCIENTIFIC ATLANTA INC. (H)	22.38	-0.63	-2.7	
NYS	44.38	38.50	SOUTHWESTERN BELL CORP.	40.88	-0.25	-0.6	
NYS	40.13	25.88	SPRINT CORP.	28.38	-1.13	-3.8	
OTC	31.63	13.38	STANDARD MICROSYSTEMS CORP.	19.75	-8.88	-31.0	
OTC	43.25	6.50	STRATACOM INC.	37.06	-0.19	-0.5	
OTC	15.25	3.88	TELEBIT CORP.	5.75	0.44	8.2	
OTC	59.25	24.00	US ROBOTICS	59.25	6.38	12.1	
NYS	43.75	34.63	US WEST INC.	38.50	-0.13	-0.3	
OTC	28.25	12.75	XIRCOM	16.75	-0.25	-1.5	
OTC	28.00	8.00	XYLOGICS INC.	20.00	-3.25	-14.0	

PCs and Workstations				UP 0.70%			
OTC	7.50	3.50	ADVANCED LOGIC RESEARCH	4.38	0.00	0.0	
OTC	48.00	24.63	APPLE COMPUTER INC.	40.31	1.47	3.8	
OTC	24.75	10.38	AST RESEARCH INC.	15.38	1.25	8.8	
NYS	44.38	29.50	COMPAQ COMPUTER CORP.	34.50	-0.25	-0.7	
OTC	47.75	21.25	DELL COMPUTER CORP.	41.38	-1.94	-4.5	
OTC	25.25	9.25	GETWAY 2000 INC.	18.25	-1.00	-5.2	
NYS	117.50	71.88	HEWLETT PACKARD CO.	116.50	0.75	0.6	
NYS	35.88	18.75	SILICON GRAPHICS (H)	35.25	1.00	2.9	
OTC	37.63	18.25	SUN MICROSYSTEMS INC.	31.38	-0.38	-1.2	
NYS	52.38	30.75	TANDY CORP.	44.75	-1.13	-2.5	
OTC	12.00	2.38	ZEOS INTERNATIONAL LTD.	12.00	0.63	5.5	

Large Systems				OFF 2.65%			
ASE	12.00	5.25	AMDAHL CORP.	10.63	-0.50	-4.5	
NYS	8.88	4.38	CONVEY COMPUTER	6.13	0.00	0.0	
OTC	2.75	0.50	CRAY COMPUTER	1.06	-0.13	-10.5	
NYS	33.75	14.63	CRAY RESEARCH INC.	17.25	1.00	6.2	
NYS	12.00	6.63	DATA GENERAL CORP.	7.88	-0.13	-1.6	
NYS	38.75	18.25	DIGITAL EQUIPMENT CORP.	33.00	-0.75	-2.2	
OTC	6.38	1.72	ENCORE COMPUTER CORP.	2.53	-0.28	-10.0	
OTC	18.25	6.50	HARRIS COMPUTER SYSTEMS CORP. (H)	16.75	0.00	0.0	
NYS	78.13	51.38	IBM	78.13	3.25	4.3	
OTC	17.25	5.00	NETFRAME	6.63	0.13	1.9	
OTC	13.75	3.63	PARALLAN COMPUTER	5.50	-1.38	-20.0	
OTC	16.00	5.38	PYRAMID TECHNOLOGY	15.88	0.00	0.0	
OTC	21.25	11.13	SEQUENT COMPUTER SYS.	17.50	-0.13	-0.7	
OTC	6.56	3.13	SEQUOIA SYSTEMS INC.	4.13	0.13	3.1	
NYS	39.88	22.88	STRATUS COMPUTER INC.	26.25	-0.75	-2.8	
NYS	19.75	10.50	TANDEM COMPUTERS INC.	16.38	-1.13	-6.4	
OTC	18.25	3.88	TRICORD SYSTEMS	5.38	-0.25	-4.4	
NYS	16.50	8.25	UNISYS CORP.	9.13	0.00	0.0	

Software				UP 1.79%			
OTC	38.50	21.50	AUTO DESK INC.	35.38	1.13	3.3	
OTC	6.38	2.50	AMERICAN SOFTWARE INC.	3.88	0.94	31.9	
OTC	41.50	23.25	AUTODESK INC.	39.38	0.69	1.8	
OTC	5.38	1.75	BACHMAN INFO. SYSTEMS	4.25	-0.25	-5.6	
OTC	29.00	20.50	BGS SYSTEMS INC.	26.63	-0.19	-0.7	
OTC	71.00	40.25	BMC SOFTWARE INC.	64.00	-1.75	-2.7	
OTC	30.50	15.31	BOOLE & BABBAGE	30.00	0.69	2.3	
OTC	15.13	6.00	BORLAND INT'L INC.	7.50	-1.25	-14.3	
OTC	22.25	6.00	BROCK CONTROL SYSTEMS INC.	6.25	-0.50	-7.4	
OTC	4.00	1.78	CE SOFTWARE	3.31	0.06	1.9	
ASE	30.25	6.00	CHEYENNE SOFTWARE INC.	16.88	1.00	6.3	
OTC	21.88	9.75	COGNOS INC. (H)	20.75	-0.38	-1.8	
NYS	60.50	27.38	COMPUTER ASSOCIATES (H)	60.50	2.63	4.5	
NYS	6.13	2.50	COMPUTERVISION CORP.	5.63	0.25	4.7	
OTC	49.25	31.25	COMPUWARE CORP.	35.25	-2.38	-6.3	
OTC	17.25	9.00	COMSHARE INC.	16.63	0.00	0.0	
OTC	16.75	10.13	COREL CORP.	13.38	0.63	4.9	
OTC	14.25	7.25	DATAWARE TECHNOLOGIES INC.	11.75	0.00	0.0	
OTC	6.75	2.25	EASEL CORP.	2.88	-0.13	-4.2	
OTC	33.75	14.25	FILENET CORP.	31.00	0.00	0.0	
OTC	11.88	3.00	4TH DIMENSION	5.25	0.38	7.7	
OTC	19.25	8.50	FRAME TECHNOLOGY	16.25	-0.13	-0.8	
OTC	35.25	11.50	FTP SOFTWARE INC.	28.50	1.38	5.1	
OTC	10.50	7.00	GROUP I SOFTWARE	9.50	0.00	0.0	
OTC	30.25	6.75	GUPTA	10.50	0.63	6.3	
OTC	10.75	4.63	HOGAN SYSTEMS INC.	6.25	-0.13	-2.0	
OTC	45.50	18.00	IMRS	43.75	1.13	2.6	
OTC	23.50	11.25	INFORMATION RESOURCES	15.25	0.13	0.8	
OTC	39.38	14.25	INFORMIX CORP. (H)	39.38	1.75	4.7	
OTC	13.75	7.38	INTERGRAPH CORP.	13.75	1.44	11.7	
OTC	8.75	2.50	INTERLEAF INC.	4.88	0.13	2.6	
OTC	18.25	8.63	INTERSOLV INC.	14.38	-0.63	-4.2	
OTC	73.25	27.00	INTUIT INC.	66.13	1.13	1.7	
OTC	37.25	19.00	LEGENT CORP.	29.50	0.25	0.9	

KEY: (H) = NEW ANNUAL HIGH REACHED IN PERIOD (L) = NEW ANNUAL LOW REACHED IN PERIOD

COPYRIGHT NORDBY INTERNATIONAL INC., BOULDER, COLORADO

THIS INFORMATION IS BASED ON SOURCES BELIEVED TO BE RELIABLE, AND WHILE EXTENSIVE EFFORTS ARE MADE TO ASSURE ITS ACCURACY, NO GUARANTEES CAN BE MADE. NORDBY INTERNATIONAL AND COMPUTERWORLD ASSUME NO LIABILITY FOR ANY INACCURACIES. FOR INFORMATION ON NORDBY'S CUSTOMIZED FINANCIAL RESEARCH SERVICES, CALL 1 (800) 926-7404.

EXCH 52-WEEK RANGE

MAR. 3 WK NET WK PCT  
3PM CHANGE CHANGE

OTC	86.50	29.75	LOTUS DEVELOPMENT	41.50	-1.50	-3.5
OTC	16.75	4.38	MAGIC SOFTWARE ENTERPRISES	5.25	-0.13	-2.3
OTC	14.75	6.00	MANUGISTICS GROUP INC.	11.50	1.00	9.5
OTC	27.75	14.75	MAPINFO CORP. (H)	27.25	2.00	7.9
OTC	6.38	1.44	MATHSOFT	3.25	0.00	0.0
OTC	22.75	6.50	McAfee Associates (H)	21.50	0.50	2.4
OTC	17.25	9.38	MENTOR GRAPHICS	12.88	-0.63	-4.6
OTC	20.00	11.50	MICRO FOCUS	12.13	0.13	1.0
OTC	9.75	4.63	MICROGRAFX INC.	6.63	0.38	6.0
OTC	65.25	39.88	MICROSOFT CORP.	63.31	2.06	3.4
OTC	45.00	11.25	NETMANAGE INC.	35.00	-2.50	-6.7
OTC	32.13	17.50	ORACLE CORP.	31.88	1.13	3.7
OTC	40.25	21.50	PARAMETRIC TECHNOLOGY	39.00	0.75	2.0
OTC	24.50	13.38	PARCPLACE SYSTEMS INC.	17.50	-0.50	-2.8
OTC	39.50	13.00	PEOPLESOFT	38.00	2.88	8.2
OTC	8.50	4.38	PHOENIX TECHNOLOGIES	7.38	0.13	1.7
OTC	14.75	3.50	PLATINUM SOFTWARE	8.00	-0.06	-0.8
OTC	25.25	11.00	PLATINUM TECHNOLOGY	22.38	-1.38	-5.8
OTC	56.75	27.00	PROGRESS SOFTWARE CORP.	53.25	-1.00	-1.8
OTC	4.38	1.88	QUARTERDECK OFFICE SYS.	3.94	-0.03	-0.8
OTC	20.00	9.50	RAINBOW TECHNOLOGIES INC.	18.13	1.63	9.8
OTC	7.75	2.00	RASTEROPS	4.50	-0.63	-12.2
OTC	7.13	2.88	ROSS SYSTEMS	4.63	-0.38	-7.5
OTC	15.25	0.50	SAPIENS INTL. CORP. N.V.	2.81	0.06	2.3
OTC	28.63	9.75	SOFTKEY INTERNATIONAL INC.	26.50	2.38	9.8
OTC	7.63	3.00	SOFTWARE PUBLISHING CORP.	3.88	-0.13	-3.1
OTC	10.13	5.00	STATE OF THE ART	10.13	1.75	20.9
NYS	38.38	25.00	STERLING SOFTWARE INC.	36.75	0.75	2.1
OTC	16.50	3.63	STRUCT. DYNAMICS RESEARCH	6.50	0.00	0.0
OTC	57.00	35.25	SYBASE INC.	42.75	1.00	2.4
OTC	21.50	9.88	SYMANTEC CORP.	19.63	0.00	0.0
OTC	50.75	33.00	SYNOPSYS	50.75	2.75	5.7
OTC	24.63	10.63	SYSTEM SOFTWARE ASSOC. (H)	24.13	0.88	3.8
OTC	7.38	3.25	TRINZIC CORP. (H)	7.38	-0.88	13.5
OTC	30.00	7.88	VIEWLOGIC SYSTEMS	9.50	-0.88	-8.4
OTC	23.25	12.25	VIMARK SOFTWARE INC.	15.25	-0.13	-0.8
OTC	13.25	5.50	WALKER INTERACTIVE SYSTEMS	7.38	0.00	0.0
OTC	60.00	29.25	WALL DATA INC.	52.13	7.88	17.7



# IN 10 DAYS, DELL CAN INSTALL 1000 CUSTOMIZED SYSTEMS ALL OVER THE COUNTRY FOR YOU.

(Of course, you could also do it yourself.)



Managing a large-volume project can take a miracle. Fortunately, you don't have to rely on one.

Just rely on Dell. Unlike most big PC vendors, we're direct. And since we're direct, we can offer you quality hardware, systems integration and project roll-out management, all from one source.

To begin with, we can custom-build each system to your specifications, no matter how many configurations you need.



We can preload your software, even your proprietary software. Plus, we can install the peripherals you need.

Yet another trick: we can tag your PCs with your own asset tags.

And we can deliver and install each PC at its location anywhere in the country, getting rid of your old PC in the process.

So if you need to pull off an impossible project, call for a project bid from one of our national account teams.

And remember: we'll perform the magic. But you'll get the applause.

## DELL®

**(800) 759-1260**

KEYCODE #12028

The Intel Inside logo is a registered trademark of Intel Corporation. Look for the symbol on our quality computer systems. Dell disclaims proprietary interest in the marks and names of others. © 1995 Dell Computer Corporation. All rights reserved.



## Novell bends

CONTINUED FROM PAGE 1

she added. However, neither mainstream users nor Microsoft — which is now working closely with Novell on the client requester/redirector — have received any copies of it for Windows NT Server or Windows 95.

"It's putting a chill down our backs that we haven't even seen an alpha version of client requesters that support NetWare Directory Services and support for Windows 95," said Jim Lisiak, a senior networking engineer at Chevron Information Technology Co., a division of Chevron USA, Inc. in San Ramon, Calif.

"So far, it looks as though Novell has been holding back its support. I guarantee Chevron is not going to put 16-bit [Virtual Loadable Modules] underneath a 32-bit operating system," Lisiak added.

"That's no way to run an enterprise network. It would cause countless network crashes and endless headaches."

An information systems manager at a large financial institution in the Midwest, who requested anonymity, said the fact that Novell was not delivering requesters for the Windows environment played a part in his decision to switch from NetWare 3.x to Windows NT Server last year.

### Microsoft opportunity

"The longer Novell waits to release a client requester, the more chance there is of driving customers into Microsoft's open waiting arms," said Cheryl Currid, president of Currid & Co. in Houston.

Indeed, Microsoft appears to have done everything it can to make switching as painless as possible. After Novell terminated its licensing deal allowing Mi-

crosoft to resell a NetWare requester for Windows, Microsoft built its own client redirector and bundled it into Windows clients free of charge, said Bob Kruger, director of technology and marketing in

### A rose by any other name ...

Novell calls them requesters.  
Microsoft and IBM call them redirectors or clients.

**requesters** \ri-kwest-ers\ n  
**redirectors** \re-de-rekt-ors\ n

*A piece of software that runs in the operating system or network operating system. The client receives a request for data that is not stored locally. The request is then redirected to the appropriate system or server, which then accesses the data and returns it to the requesting workstation.*

Microsoft's Business Systems Group.

"We had to do it or we would have been inundated with customer complaints," Kruger said.

Users and analysts said Novell has only hurt itself with its refusal — until now

— to deliver client requesters for Microsoft desktop platforms.

"Users shouldn't have to suffer for vendor marketing wars," said Mark Herder, data communications manager at Dartmouth Hitchcock Medical Center in Lebanon, N.H. "It would be smart business sense for Novell to deliver industrial-strength requesters for every operating system as soon as they're released."

Kruger said a "renewed spirit of cooperation" does exist now between the two companies.

Still, it is hardly smooth sailing.

"Novell has told us that its Windows NT requester is in beta test. We don't have a copy, although we've requested it to help them resolve some alleged interoperability problems," Kruger said.

Drake responded by saying "the bottom line is [that] we are now stepping up to the plate to deliver cross-platform client connectivity for both the Windows NT and Windows 95 environments."

## IBM sings blues

CONTINUED FROM PAGE 1

ware lines.

- A poorly executed merger of its corporate desktop brands.
- Difficulty building market presence for products like OS/2 (see story page 113).
- Overly conservative demand forecasts.

These problems contributed to the PC Co.'s disastrous performance last year when it suffered at least \$800 million in losses on estimated revenue of \$10 billion, analysts and other observers said.

The result has been fed up users and embarrassing drops in the company's market share. Once the undisputed market leader, the PC Co. slid to fourth place in a booming U.S. market and to second place worldwide, according to International Data Corp. in Framingham, Mass.

Still, the PC Co.'s product releases this week may push back some rivals and help the company regain market share, if not a stable hold on user affections.

The company will lead with its best

punch, the ThinkPad 701C notebook computer, followed by a roundhouse right from its server group, which will offer the PC Server 320 and 720 series.

While the ThinkPad family has been IBM's sole bright spot in the PC market in the past year, analysts said the new servers should succeed. During 1994, IBM lost significant ground to server rivals, particularly Compaq Computer Corp. and Hewlett-Packard Co.

### One of the crowd

Server woes have contributed to the company's overall PC problems, and success in the server market will help IBM regain some momentum, observers said. Still, IBM's core corporate desktop business remains its weakest point, as it has been for at least two years.

These intransigent PC problems have cost IBM significant goodwill among customers. "What IBM has to realize is that when it comes to making PCs, they are like any other clone manufacturer these days," said Peter Prellwitz, a microcomputer support specialist at W. B. Saunders Co. in Philadelphia. He no longer

## Cannavino retires

*Fifty years old and loquacious as ever, James A. Cannavino, senior vice president for strategy and development, is entering what he promises will be a brief retirement. He spoke with Computerworld senior editor Michael Fitzgerald last week, citing as his finest achievements at IBM the development of the 3081 and 3090 mainframe families and the creation and accomplishments of the PC Co.*

**Q: Why leave IBM after 32 years?**

**A:** I've had kind of the itch for a while to go be the guy who runs the company.

When [IBM Chairman Louis] Gerstner arrived, I was eligible to retire. I told him I would retire immediately if he wanted me to. He asked me to stay for two years, and I did that.

There's only one business at IBM; Gerstner's running it, and he's doing a fantastic job.

**Q: Do you have regrets about IBM's OS/2 strategy?**

**A:** I kind of started on OS/2 in the middle of things. I think the team has done a great job and is finally starting to get some mind share time with ISVs. For a while there, the biggest problem was you couldn't get any ISV support. They know now that if they don't diversify a little bit, it'll hit them. Some people think it's over [for OS/2], and I think it's just starting out.

## Troubles abound for OS/2

**T**he troubled tale of OS/2 is rumored to be nearing a close. Several sources close to IBM said the company is seriously considering reducing the amount of money it invests in the operating system.

While no one says OS/2 will go away — millions of copies of OS/2 are in the market, and it is strategic to some two dozen of IBM's largest accounts — the sources said IBM could reduce it to maintenance status.

For now, IBM executives are said to be 100% behind OS/2, greater volumes of which have been sold as Microsoft Corp. continues to delay the release of its Windows 95.

IBM software chief John Thompson

recently sent out a memo affirming IBM's commitment to OS/2 [CW, Feb. 7], and Lee Reiswig, general manager of IBM's Personal Software Products group, said last week that "the question for us is should we do more, not less" with OS/2. Reiswig added that "this is not a 12-month statement [of commitment]. It's a strategic commitment, not a tactical one."

Nonetheless, the sources said that if Windows 95 sharply outsells OS/2 when it comes out, OS/2 support will rapidly ebb at the highest echelons of the company.

*Compiled by Michael Fitzgerald, Jaikumar Vijayan and Craig Stedman.*

considers IBM for purchases because of what he called an IBM attitude that says, "Things don't go wrong because we state that things don't."

On the supply side, IBM's problems are likely to continue throughout the year.

For instance, Bruce Claflin, the PC Co.'s general manager, said the company thinks it can leverage products such as the 701C into the No. 1 position in the notebook market but concedes that "dealers will want more than we can ship to them" until sometime after April. That means another backlog.

IBM's PC crisis reportedly has put Richard Thoman, head of the PC Co., in the hot seat. After 14 months, he has failed to deliver, even in the brand consolidation efforts that were supposed to be his forte, observers said. Despite recent public statements of support from Jerome York, IBM's chief finan-

cial officer, sources close to IBM have said Thoman may have as little as three months to hold on to his job.

But IBM has shown resilience in the PC market before. Perhaps the best case in point is the ThinkPad, which has erased

IBM's status as the butt of jokes in the notebook arena. In 1992, the year before the ThinkPad came out, IBM lost \$200 million on sales of only \$300 million for its L40SX, Claflin said.

Some users are willing to give the company a second or even third chance.

"In the last couple of years, IBM has shown that they are willing to do some of the things that are

necessary" to compete in the LAN server market, said Vincent Pepe, a systems analyst at Mutual Bank in Seattle. For instance, server management products and installation tools have added muscle to IBM's server strategy, Pepe said.

### ThinkPad 701C

- Groundbreaking keyboard expands to full size
- 10.4-in. screen
- Weight: 4½ pounds
- Size: 9.7 by 7.9 inches
- Built-in infrared

### PC Server 720

- Up to six-way multiprocessing (100-MHz Pentium)
- 512K-byte L2 write-back cache
- Up to 1G byte of 64M-bit ECC RAM
- 7 expansion slots — MCA/PCI bridge





## But did he have a spell checker?

"In *Ulysses* and *Finnegan's Wake*, [James] Joyce fissioned and sliced the grammatical structure of language into thought bytes. Imagine what he could have done with Microsoft's Word, a CD-ROM graphic system or a modern database! Well, we don't have to imagine — he actually managed to do it using his own brainware."

Source: *Chaos and Cyber Culture*, Timothy Leary, Ronin Publishing, Inc. Berkeley, Calif.

## I think it's your first left, then second right ...

If you keep losing the keyboard templates that come with your software or can't remember all 300 possible Ctrl+Alt variations, Shortcut Software in Palisades, Calif., has an on-line answer. **Shortcut Guides** are on-screen pop-up windows with detailed shortcut information for popular Windows applications. Prices range from \$14 to \$29, depending upon the application supported.

## An announcement to alter the market!

Instead of running to the Department of Justice to complain about vaporware announcements, Novelty Space is doing something about it. Now users can surf the Internet to [http://www.infohaus.com/access/by-seller/NOVELTY\\_SPACE](http://www.infohaus.com/access/by-seller/NOVELTY_SPACE), and become "authorized to vaporize." The World-Wide Web page offers the Vaporware 0.0 Lifetime Membership Collectors Edition, which includes a Vaporware 0.0 screen saver, mouse pad, T-shirt and membership card. Novelty Space said members can break promises by the dozen, miss deadlines by months, confuse entire market segments and insult their customers' intelligence and still keep them begging for more.

COMPILED BY TIM OUELLETTE (TIMO@CW.COM). ILLUSTRATIONS BY DAVID MARSHALL.

## Inside Lines

### No bug escapes IBM's wrath

An uninvited guest dropped in on a press luncheon with IBM's Lee Reiswig at last week's Share user group conference in Los Angeles. Namely, a rather large and fast-moving cockroach. "Look, the last remaining OS/2 bug," Reiswig deadpanned as the roach ran for daylight across the table. Another IBM official dutifully squashed the varmint in his napkin and handed it to a horrified waiter. If only it were so easy to take care of software bugs.

### Alliance to bear lower-cost ISDN fruits

Dallas-based Eicon Technology's recent acquisition of German ISDN market leader Diehl will bear fruit when the company introduces the so-called SOHO Connect family of remote and server access ISDN products in the next 90 days, sources close to the company said. The SOHO Connect devices are designed to provide customers with high-speed Basic Rate and Primary Rate ISDN capabilities at a low entry price point. The SOHO products will include a series of PC- and server-based ISDN adapters. The PC adapters will range in price from \$500 to \$1,000, the sources said, but pricing has not yet been set for the server products.

### One beta, two beta...

Microsoft plans to send out full beta-test copies of its SQL Server 95 database this week to about 2,000 users. Having completed three rounds of a so-called "technical beta" with mainly independent software vendors and resellers, SQL Server 95 is "feature-complete," said Dan Basica, a database product manager at Microsoft. "Now corporate users get to have at it." The database, intended to be the NT equivalent of heavyweight Unix databases from Oracle and Sybase, is due for mid-1995 delivery, Basica said.

### Those //wild.w@cky/Internet.@ddresses

It seems the nation's daily newspapers are having a terrible time coping with Internet addresses in their articles, if complaints posted on the Internet are any indication. Some newsroom computers and wire services cannot handle the @ sign because they reserve it as an internal command that happens to garble the next few characters. The fix has been to use (at) and hope an editor will replace it with the @ symbol, but (at) is still showing up in published stories (even @ the venerable *New York Times*).

### Politically correct, but will it work?

One large Oracle site has suffered headache after headache trying to install a 4,500-user E-mail system based on Oracle Office. But there's no turning back now, said a senior engineer responsible for the project. Indeed, the organization's decision to go with Office was based not on technology but on the fact that the site signed a \$1.5 million, multiyear contract for a variety of Oracle products several years ago, the engineer said. Because of that, Office "was free, in a sense. Our budget was tight. It's very political."

### Bay and Intel products roll forth today

Bay Networks and Intel Corp. today will unveil products designed to allow users to migrate their networks to 100M bit/sec. speeds. Kicking off the line is Bay's LattisSwitch 28000 "fast" Ethernet hub, which supports 10M and 100M bit/sec. connections. Intel's EtherExpress Pro/100 adapters are compatible with the switch. Bay will roll out stackable 100M bit/sec. Ethernet hubs in the second quarter, followed by router interfaces in the third quarter.

*Seems you don't have to be a Rhinestone cowboy to enjoy a star-spangled rodeo. Just being an electronic one will do. Last week the Houston Rodeo, one of the world's richest regular-season rodeos, made its Internet debut. For less than \$10, cowboys and cowgals from around the world lassoed the Houston Astrodome through the Eden Matrix Online Service home page on the Web. Their catch was a digitized live broadcast of the rodeo. If you happen to have your lariat around some hot tip you'd like to pass along, throw a line to our 24-hour tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or on the Internet at [mjohnson@cw.com](mailto:mjohnson@cw.com).*

## How to contact *Computerworld* editors:

	PHONE:	FAX:
Main office, Framingham, Mass. _____	(508) 879-0700	(508) 875-8931
24-hour tip line _____	(508) 820-8555	
Mid-Atlantic bureau, Rochelle Park, N.J. _____	(201) 587-0090	(201) 712-1808
Washington bureau, Washington _____	(202) 347-0134	(202) 347-2365
Midwest bureau, Des Plaines, Ill. _____	(708) 827-4433	(708) 827-9159
West Coast bureau, Burlingame, Calif. _____	(415) 347-0555	(415) 347-6831
Northwest bureau, Bellevue, Wash. _____	(206) 641-7770	(206) 747-1021

✉ **ELECTRONIC MAIL:** *Computerworld's* writers and editors have individual MCI Mail accounts. Most of our staff members can be reached on MCI Mail by addressing messages to their first and last names as they appear on the masthead, which is opposite the editorial page. For a complete list of editorial MCI Mail addresses, message Linda Gorgone at 597-8014.

✉ Our CompuServe account number is 76537,2413. Please use that account only for communications with writers and editors. *Computerworld* cannot guarantee response to all inquiries. Direct subscription inquiries to CompuServe: 73373,1230.

✉ Letters to the editor and other editorial-related messages can be sent via Internet to [letters@cw.com](mailto:letters@cw.com)

✉ **CLIENT/SERVER JOURNAL:** Contact Editor Alan Alper at (508) 820-8115 or via Internet at [aalper@cw.com](mailto:aalper@cw.com)

✉ **SUBSCRIPTIONS:** Inquiries and changes of address should be sent to P.O. Box 2043, Marion, Ohio 43305-2403 or call (800) 669-1002.

✉ **REPRINTS:** Contact Sharon Bryant at (508) 820-8125.

✉ **RAPID REFERENCE CLIPPING SERVICE:** (800) 343-6474 x554.



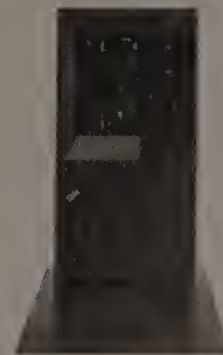
# 4.9<sup>%</sup>

If 25,000 AS/400<sup>®</sup> applications aren't enough to impress you, how about these numbers?

# 64<sub>1</sub>-bit

Beginning February 1, 1995, the Advanced Technology Lease from IBM is making it possible to upgrade or acquire a new AS/400 Advanced System at rates as low as 4.9% for 36 months. You'll also have the option to add 64-bit RISC technology by simply extending your low monthly payments while paying no additional software upgrade charge.

This offer is being made available by IBM Credit Corporation. For more information, call 1 800 IBM-3333, ext. BA101, or contact your local IBM marketing representative. Because numbers like these on AS/400 don't come around every day.

Financing available to commercial and government customers only and will vary based on customer's credit rating, financing terms and lease term selected. 4.9% financing applies to best credit rating on 24- or 36-month term lease. Advanced Technology Lease available only on 36-month term lease. Offer applies to selected systems ordered after 2/1/95 and installed by 6/30/95. These rates are available through 3/31/95. Restrictions may apply. Offer may be withdrawn at any time.IBM and AS/400 are registered trademarks of International Business Machines Corporation. ©1995 IBM Corp.



# WHO'S THE LEADER IN PENTIUM™ CHIP SYSTEMS?

(IT'S NOT WHO YOU THINK IT IS.)



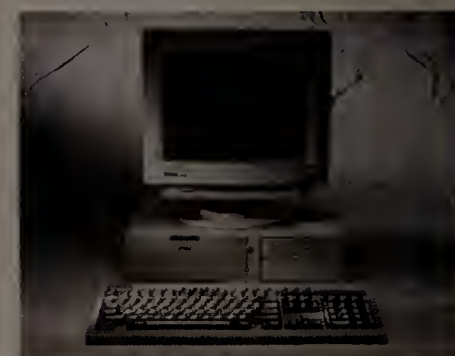
*"Dell is a major force in the industry's transition  
to the Pentium processor."*

—ANDREW S. GROVE, PRESIDENT & CEO, INTEL

According to a recent report from Workgroup Technologies,<sup>A</sup> Dell shipped more Pentium™ chip systems worldwide during 1994 than either IBM or Compaq.

We offer a full line of OptiPlex™ Pentium processor-based systems. And we're committed to offering reliable Pentium processor-based systems. In fact, every one we sell now has the updated Pentium processor. Which ensures you a platform ready for powerful new applications, like Windows® 95, when they arrive.

So call us. Because it's smart business to move to Pentium chip systems. And even smarter business to move to Dell.



## OPTIPLEX™

### UPDATED PENTIUM™ PROCESSORS

- DELL® OPTIPLEX 560/L  
60MHz PENTIUM PROCESSOR
- 8MB RAM/270MB Hard Drive
  - VS14 Monitor (14" CRT, .28mm)
  - Guaranteed Compatibility†
  - 3 Year Warranty†

**\$1599**

Product Code #300247

- DELL OPTIPLEX XL 575  
75MHz PENTIUM PROCESSOR
- 8MB RAM/540MB Hard Drive
  - VS14 Monitor (14" CRT, .28mm)
  - Guaranteed Compatibility†
  - 3 Year Warranty†

**\$1979**

Product Code #300275

- DELL OPTIPLEX XL 590  
90MHz PENTIUM PROCESSOR
- 16MB RAM/540MB Hard Drive
  - VS14 Monitor (14" CRT, .28mm)
  - Guaranteed Compatibility†
  - 3 Year Warranty†

**\$2545**

Product Code #300293

# DELL®

**(800) 388-1510**

MONDAY-FRIDAY 7AM-9PM CT • SATURDAY 10AM-6PM CT • SUNDAY 12PM-5PM CT  
KEYCODE #12027 • CANADA\* CALL 800-387-5755 • MEXICO CITY\* CALL 800-228-7811



†For a complete copy of our Guarantees or Limited Warranties, please write Dell Computer Corporation, 2214 W. Braker Lane, Bldg. 3, Austin, TX 78758. If you encounter a compatibility problem within 3 years after the original purchase, we guarantee that Dell's engineers and technicians will work with you to identify the cause and recommend a solution. Guarantee does not extend to software and devices not intended to run on comparable ISA or EISA systems of the same vintage. <sup>A</sup>Source: Workgroup Technologies, ©1994 Market Model. \*Prices and specifications valid in the U.S. only and subject to change without notice. The Intel Inside and Pentium Processor logos, and Pentium are trademarks of Intel Corporation. Windows is a registered trademark of Microsoft Corporation. Dell disclaims proprietary interest in the marks and names of others. ©1995 Dell Computer Corporation. All rights reserved.